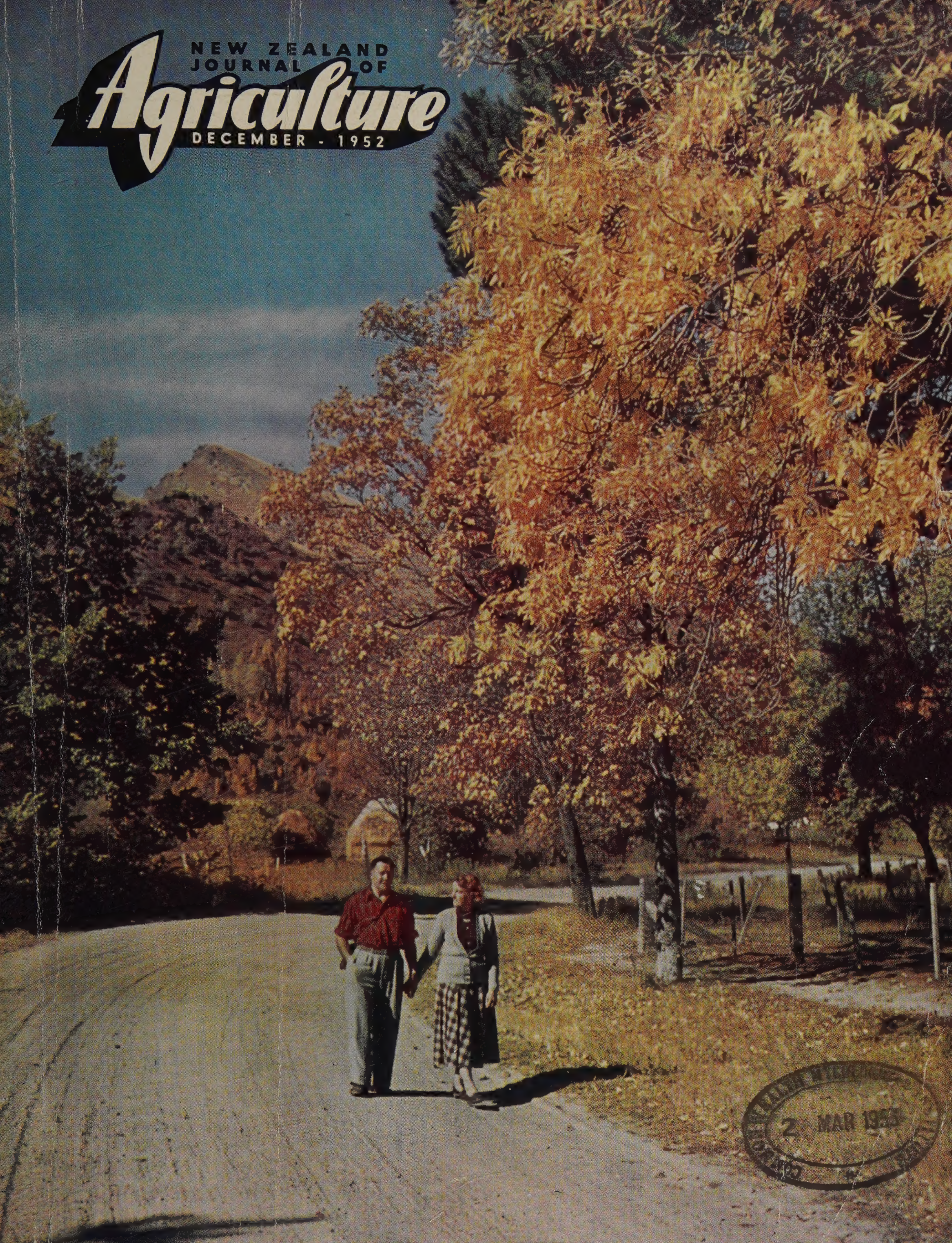
NEW ZEALAND JOURNAL OF
Agriculture
DECEMBER - 1952



2 MAR 1953

Cooper's
World-famous Stock Remedies

Cooper News

FARM BULLETIN published by COOPER, McDOUGALL & ROBERTSON (N.Z.) LTD.
World famous Manufacturers of Sheep Dips, Worm Drenches and other Stock Remedies.

No. 27 PUBLISHED EVERY SECOND MONTH December, 1952

PHENOTHIAZINE DRENCHING

COOPAZINE (Cooper's Phenothiazine)
is available in both powder and liquid forms.

COOPAZINE POWDER is packed in 1lb. cartons and 10lb. tins and 1lb. is sufficient to drench from 20 to 30 sheep and from 10 to 20 cattle.

COOPAZINE LIQUID is in 1 gallon tins with convenient handles for carrying. It is ready for use and after an initial stirring a good suspension is maintained for a prolonged period. One gallon drenches from 106 to 160 sheep according to age and from 53 to 106 cattle.

FOR YOUR PHENOTHIAZINE DRENCHING INSIST ON COOPAZINE WHICH HAS THE COOPER ASSURANCE OF RELIABILITY.

OTHER COOPER DRENCHES

COOPER'S N.C.A. DRENCH

Combines nicotine and copper sulphate in scientific form. A 16oz. bottle makes sufficient drench to do 160 sheep or 426 lambs or 80 to 320 cattle according to age. Specially recommended for tapeworm control.

COOPER'S FLUKE AND WORM DRENCH

Contains Carbon Tetrachloride and is the remedy for Liver Fluke. Packed in quarts, halves and gallons—1 gallon does 900 sheep or lambs.

DRENCH WITH EASE AND ACCURACY WITH A
VICTOR Drenching Gun

To our friends we extend
**Best Wishes
for Christmas
and
the New Year**

COOPER'S
Aerosol
FLY
RAPIDLY DESTROYS FLYING INSECTS

KILL FLIES
at the touch of a button

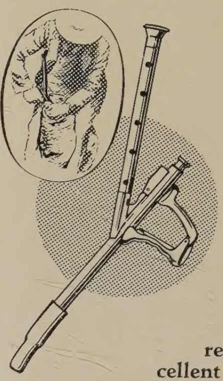
COOPER "AEROSOL"

Flies cannot escape the almost invisible mist from a COOPER HOUSEHOLD AEROSOL. The touch of your finger on a button automatically releases a cloud of insecticide that spreads through the room and blankets the pests.

Contains safe and super-efficient "Pybuthrin" and is nine times more powerful than ordinary fly sprays.

Packed in 12oz. and 20oz. sizes and stocked by many Stock and Station Agents. Others can procure.

No Pumping, No Filling, No Mess.



BECK REPEATER TABLET GUN

We thoroughly recommend this excellent new automatic gun for the easy and accurate administration of phenothiazine tablets. Main features are:

(1) Full dose of 3, 4, or 5 tablets can be administered without removing the gun from the animal's mouth. Complete control is always retained.
(2) When filled to capacity, two lambs can be dosed (3 tablets each) without refilling.
(3) Refilling is easy. Tablets just dropped into the magazine and cannot fall out.
(4) Rubber sheath extends the length of one tablet past the end of the barrel. Thus the first tablet is fully enclosed in rubber with cushioning effect to minimise chance of throat damage.
(5) Extra long barrel makes it a very suitable Gun for drenching calves.
(6) When used correctly the required dose can be administered smoothly, efficiently and accurately.

The BECK Gun will meet your requirements. Many hundreds are already in use.

If your Merchant has none in stock he can procure. Price £4.

Eradicate LICE with

COOPER'S LOUSE POWDER

COOPER'S LOUSE POWDER is non-poisonous, non-irritant, and on cattle will not taint the milk. Try it and note the spectacular results. In 1lb. duster top cartons.

All the products featured on this page are obtainable from Stock and Station Agents and Merchants, or write to:
COOPER, McDOUGALL & ROBERTSON (N.Z.) LTD., Box 599, Auckland.

Volume 85
Number 6
15 December
1952.
(Established 1910)

NEW ZEALAND JOURNAL OF Agriculture

Published by
Direction
of
Hon. K. J. Holyoake,
Minister of Agriculture.

This Month's Cover

A scene near Arrowtown, Central Otago, is the subject of this month's cover, which has been reproduced from an Ektachrome (Kodak (N.Z.) Ltd.) colour photograph by T. Lloyd. Arrowtown, a boisterous mining community about the 1860's, is now the centre of a prosperous farming area. With the aid of irrigation dairy farming and fat lamb raising are carried on and the district also produces pasture, barley, and turnip seeds and crops of wheat and oats. The only cheese factory in the district is on the outskirts of Arrowtown.

TABLE OF CONTENTS

Twelve Killed by Tractors in 1951	C. J. Crosbie ..	466
Show Dates	.. .. ..	474
Planting Shelter for Pigs	J. P. Burrell and I. H. Owtram ..	475
Malting Barley Variety Trials in Ellesmere County	P. R. Barrer ..	479
Analysis of Farming in New Zealand other than Dairy and Sheep Farming	W. N. Paton ..	484
Disease in the Household Poultry Flock	.. .. ..	487
Honey House Construction	C. R. Paterson ..	491
Radio Broadcasts	.. .. ..	494
Preventing Fires in Harvesting Machinery ..	C. J. Crosbie ..	495
The Home Orchard in Summer	C. E. K. Fuller ..	497
Bluestone Absorbed by Wool Affects Processing	L. F. Story ..	501
Care of Livestock during January	.. .. ..	504
Dairy Produce Graded for Export	.. .. ..	504
Pasture Management and Threshing of Clover (Seasonal Notes)	.. .. ..	505
Cauliflower Mosaic: A Virus Disease of Brassicas	P. R. Fry ..	507
Domestic Beekeeping	T. P. J. Williams ..	509
Population Movement from Country to Towns ..	D. A. Viggers ..	510
Grape Growing in the Home Garden	F. Berry-Smith ..	521
Recent Research Work: Production from Irrigated Land	.. .. ..	525
Common Faults in the Packing of Apples ..	R. I. June ..	526
The Home Garden	C. L. Napier ..	529
Meteorological Records	.. .. ..	536
Tea Dishes Can be Prepared in Advance ..	Maud B. Strain ..	537
Home Science School	Eleanor Couston ..	540
Long-sleeved Sports Pullover for Summer ..	.. .. ..	543
Rayon Fabrics	Maud B. Strain ..	544
Salad Dressings	Nell Macpherson .	548
The Flower Garden	C. K. Ellis ..	549
Equipment and Planning for an Ideal Kitchen ..	Eirene E. Unwin ..	555

New Zealand Department of Agriculture

HEAD OFFICE:
Dominion Farmers' Institute Building,
Featherston Street, Wellington.

DIRECTOR-GENERAL:
E. J. Fawcett

ASSISTANT DIRECTOR-GENERAL:
R. B. Tennent

DIVISIONAL DIRECTORS:
Animal Industry .. J. E. McIlwaine
Animal Research .. .. J. F. Filmer
Dairy .. .. H. A. Foy
Extension .. .. P. W. Smallfield
Horticulture .. .. A. M. W. Greig

Editor: G. J. Neale

SUBSCRIPTION RATES

The "Journal" is issued monthly. The subscription within New Zealand is 10s. a year; the overseas subscription is 13s. (sterling). The "Journal" may be ordered from any bookseller or newsagent, or direct from any office of the Department of Agriculture. Individual copies are available from Publications Section, P.O. Box 2298, Wellington, at 1s. a copy, post free.

Subscription inquiries (preferably accompanied by the address cut from a recent "Journal" wrapper) should be sent to the nearest office of the Department of Agriculture.

COPYRIGHT PROVISIONS

Articles in "The Journal of Agriculture" are copyright, but may be reprinted, **provided both the "Journal" and author are acknowledged.**

The Minister of Agriculture does not accept responsibility for any of the private and trade advertisements included in this publication.

All correspondence relating to the "Journal" should be addressed to the Editor, "The New Zealand Journal of Agriculture", P.O. Box 2298, Wellington.

REGISTERED AT THE G.P.O., WELLINGTON, AS A MAGAZINE.

Children on Tractors

A TRAGIC feature of the 1952 farm fatalities to the end of September is that 15 children lost their lives either through inexperience or the negligence of others in allowing them to be exposed to dangers over which the children had no control. Six children have already been killed this year by tractors and/or their associated implements, four were drowned and two killed by horses, one was accidentally shot while playing, another had its clothing entangled in a pump shaft in a cowshed, and one was killed when the jeep he was driving with a trailer attached overturned on the road.

A boy 13 years of age had his coat caught in an unprotected power take-off shaft of a tractor mower on which he was riding. A boy 3¼ years old fell off a tractor on which he was riding and a 10-ton roller passed over him. A 2-year-old child on a stationary tractor fell off when the tractor moved backward and a rear wheel crushed him. When a tractor being overhauled slipped off its jacks it fell on a 22-month-old boy and killed him. A girl 4 years old ran in front of a tractor-drawn field roller and was killed, and an 11-year-old boy was badly gashed in the leg by a set of tractor-drawn discs and died from loss of blood and shock.

That these children have been killed is in itself tragic, but that some of the deaths were the direct result of gross negligence and carelessness on the part of tractor drivers is a matter of some concern that deserves further inquiry.

A driver of a car on the road would be breaking the law if he had a child on his knee while driving. On a farm he can do as he likes with his tractor. There is no legislation covering the number of people riding on a tractor on a farm, but more than one on a tractor on the road means that the driver is liable for unsafe loading of his machine. With one exception, farm tractors in New Zealand are built to seat only one person—the driver—and others riding on the machine are subject to a very grave risk of injury should an accident occur.

To all interested in starting a safety campaign to save life it is earnestly recommended that the initial step should be to keep children off farm tractors and away from tractor-operated equipment.

These machines are the major cause of accidents resulting in the loss of life of farm children.

Twelve Killed by Tractors

OF the 47 farmers and farm children killed accidentally in 1951, tractors were responsible for 12 fatalities and associated with the death of one other farmer. Since 1939, 77 fatalities of the 424 that have occurred on farms and in the bush have been directly associated with tractors. To assist in reducing the terrible toll tractors are taking of farm people, the Department of Agriculture has in operation a farm safety campaign in which great emphasis is placed on safe tractor operation.

THE following cases, detailed by C. J. Crosbie, Machinery Instructor, Department of Agriculture, Christchurch, from reports supplied by officers of the Police Department and instructors of the Department of Agriculture, are presented so that drivers and others associated with tractors will be conversant with the cause of each fatality and so be better able to operate their machines without danger to themselves or others.

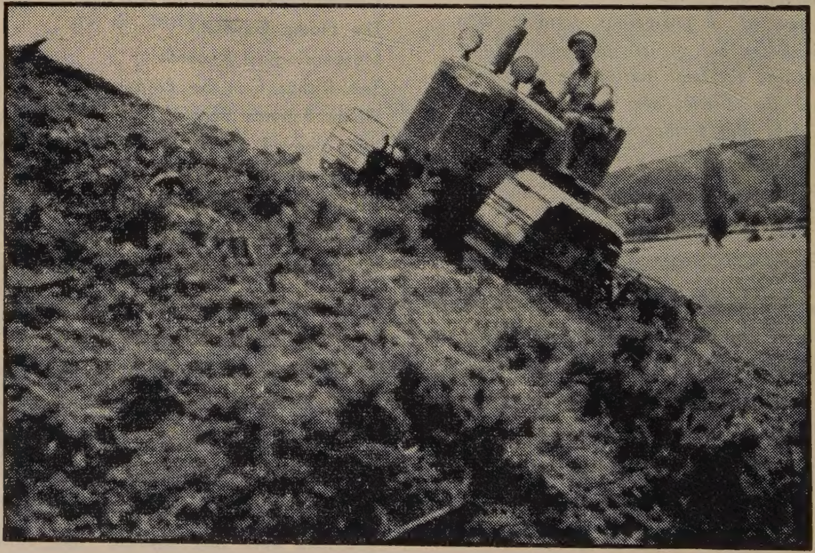
Fatalities Caused by Tractors

1. The driver of a bulldozer engaged in hauling logs in the bush was killed instantly when the machine rolled over. The weather was very wet and the logging track was slippery. Although warned not to work if conditions were slippery, he was pulling a log down a steep part of the track when his machine ran away downhill, slewed to the right, and rolled over when the log being pulled caught under the rear-mounted winch of the tractor.

2. Warned by the farmer not to work on steep faces, a tracklayer driver had been engaged in ploughing easy hill country and at the end of the day unhitched from his plough in the furrow to drive back to the dump for the night. Normally cautious, the driver instead of taking the usual level track back to the dump attempted to take a short cut across a steep gully and while climbing out of the gully the tractor turned a complete somersault; the driver was hit on the head and was dead when found. He had attempted to climb an impossible slope which in addition to being very steep had shelves on it, some 18in. high. It was against one of these shelves that the tractor stopped, and started to burrow in, and it is assumed that when the driver opened the throttle the machine reared up and capsized backward to turn a complete somersault and run back 50yds. into the gully. When examined the clutch, gears, and levers worked normally and the tank was full of diesel fuel.

This was the second driver killed on this tractor in 6 months (the other unfortunate happening was detailed as Case 1 in the November 1951 issue of the "Journal"). In neither case was it shown that the tractor in any way contributed to the primary cause of the fatality.

3. After parking his wheeled tractor and sledge on a rather steep hill track, but on a portion that was of only moderate steepness, a farmer proceeded to break up some hardened bags of cement to pave the track. While the driver was so engaged the tractor must have started to creep forward, and when running to try to stop it the driver tripped. Putting his hand out to save himself, he caught the



Operators of tracklaying machines engaged in breaking in steep, scrub-covered hillsides must always be on the alert against their machines rolling over. If the top track passes over a stump, mound, or stone, or if the bottom track drops over the edge of a bench, the unit will capsize.

in 1951

steering wheel of the tractor, pulling it on the hard-right lock. It plunged over the bank, knocking him over and landing with its right wheel on top of him.

An examination after the fatality showed that the tractor ignition key was turned off, the gears were in neutral, and the brakes were off. The officers inspecting the machine are of the opinion that the brakes, which were in perfect condition, could not have been fully applied, thus causing the creep, and the jar of the tractor falling over the bank was sufficient to free the brake completely from the brake ratchet.

4. When he drove his wheeled tractor down the road a farmer turned off the road in to a gateway, parked his machine on a concrete bridge across an irrigation race, and dismounted to open the hurdles across the gateway. The bridge was above the level of the field and the approach to it dropped 1ft. in a distance of 15ft. When the farmer was opening the gate the tractor moved forward and knocked him down. In the fall he dislocated his neck and died in hospital 3 days later.

5. A driver was driving a home-made tractor along a road from one field to another when it went over a bank about 12ft. high and fell into a stream. The driver was drowned. Wheel marks on the road showed that the tractor had first veered to the left into the left-hand water-table and then sharply to the right, crossing the road and going over the bank into the stream.

The machine was found in 5ft. of water with the driver under it with one arm round the steering column. The tractor was examined after the mishap and was found to be in good mechanical order. Chains were fitted to the rear wheels at the time of the accident.

6. When he was engaged in carting home a load of firewood in an old cart fitted up as a trailer, the driver of a rubber-tyred tractor had to come down a 30-degree southern slope that was frozen hard after a heavy frost. He traversed part of the way down at a slight angle, when his machine went into a part skid—the speed of the tractor and loaded trailer was greater than the turning speed of the rear wheels. The driver was able to control the tractor for about 20yds., but at that stage he must have decided to steer round to avoid bumping into some old cattle tracks. At this stage control was lost and the machine skidded sideways; the back wheel dropped 15in. into one track just as the front wheel met an obstruction, so that the tractor rolled over to land upside down with the driver's head crushed between the back of the seat and the ground.

When examined the tractor was in third gear in the low box, the wheels were in their narrowest setting (about 52in. tread), and the ignition key was turned off. The driver, who was capable and experienced, was known to be in the habit of switching off the ignition when danger threatened. The tractor was fairly new, had done little work, and it and the tyres were in good order, having recently been inspected by the firm's representative.

7. An orchardist who had lost his left eye in the Second World War was driving his wheeled tractor past a shingle pit on his left when the front wheels and then the back wheels of his machine went over the edge of the pit so that it capsized into the pit and crushed the driver beneath it. The tractor was fitted with a home-made crane and was travelling with a 44-gallon drum of oil in the sling at the time of the accident, which probably decreased the stability of the machine. When examined the tractor's motor, brakes, and steering and hydraulic system were still effective.

8. A tracklayer driver who was engaged in giant discing steep country was endeavouring to finish a few square yards that had been encircled and while travelling on a slight downhill course placed his machine in such a position that it rolled over and crushed him, rolled over again, and ran for 5 or 6 chains before it ended up in a blind tomo (deep crater-like depression). At the place of the capsize the top track was 38in. above the lower; the tracks were 64in. wide, which indicates that the machine rolled over on a slope of approximately 36 degrees. The driver died later under an operation.

9. A tractor driver with his brothers collecting firewood in a trailer was three-quarters of the way up a farm road that was not unduly steep and approximately 10ft. wide when his wheeled tractor skidded and dug in about 6in. The wheels were blocked to prevent the tractor running back. A

First Aid on the Farm

A recent tragic happening where an 11-year-old child ran unnoticed in front of a set of tractor-drawn discs, received a severe gash under the left knee, and died from loss of blood and shock soon after the doctor arrived serves to illustrate that an elementary knowledge of first aid is essential to all engaged in farming. Had this child received immediate elementary treatment for the wound and for shock, it is probable that he would have lived.

* * *

Can you distinguish between arterial and venous bleeding?

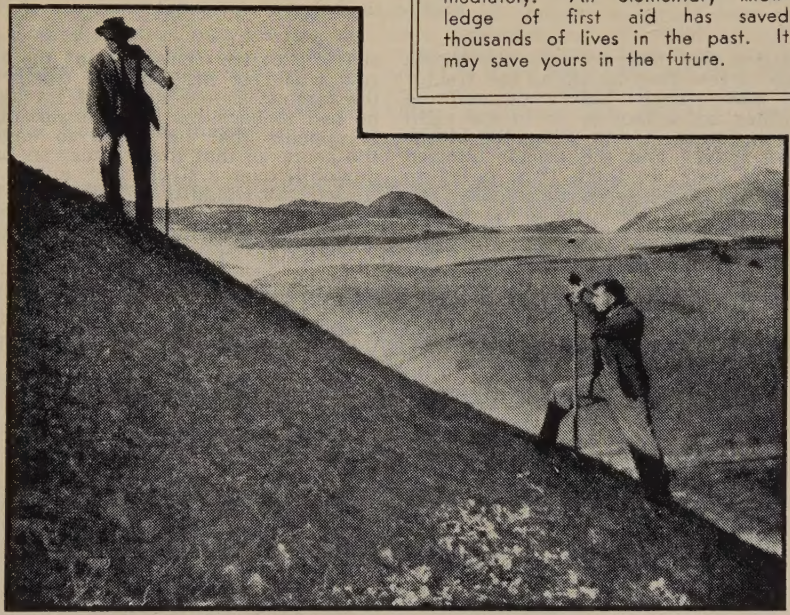
Do you know the various pressure points to arrest arterial bleeding?

Can you apply a tourniquet and for how long would you leave it before slacking off the pressure and reapplying it if necessary?

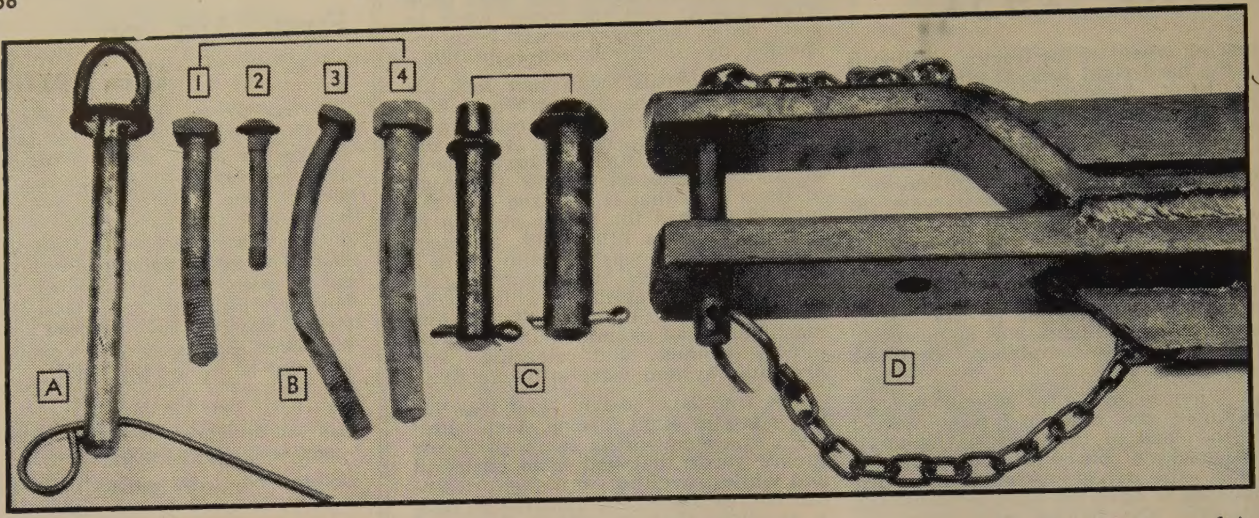
What is the elementary treatment for shock?

If you cannot answer the above questions, it is strongly recommended that you club together with others and arrange for a series of lectures on elementary first aid. Doctors, officers of the Order of St. John, and officers of the Health Department, if consulted, will readily arrange lectures and show films where they are available.

Act on this recommendation immediately. An elementary knowledge of first aid has saved thousands of lives in the past. It may save yours in the future.



This sharp pinch in a steep hillside was 34 degrees and had been worked into a seed-bed by a tracklaying tractor driven by a very experienced driver. This slope represents the highest limit at which any tracklayer should be worked and then only very carefully by a fully experienced operator.



[*Standish and Preece photo.*

A man lost his life last year when he broke his neck in a fall from a trailer. When the pin jumped out of the tractor drawbar the trailer drawbar fell to the ground, stopping the trailer suddenly and causing the man's fall. A—A safe, efficient drawbar pin that can be made from a length of axle steel with a washer and loop welded on with high-tensile welding rod. A hole is drilled through the pin approximately 2in. below the lower jaw of the drawbar, and a piece of No. 8 wire passed through the hole will prevent the pin jumping out. If this hole is drilled too close to the drawbar jaw, the wire may be sheared off when the pin is lifted by the implement drawbar as the machines work over uneven ground. B—A selection of bolts of various sizes taken from a tractor after its return from the field. The first two were used to position the swinging drawbar on its quadrant, the third had been used as a drawbar pin, and the fourth was carried as a spare. Bolts are not recommended for use as drawbar pins, first, because they are invariably of mild steel, which wears badly, and secondly, because threads soon get burred and it is then impossible to fit nuts to hold them down, and they will jump out and cause accidents; ⅜in. and ½in. bolts are too small for the strains imposed on them by the average tractor. C—Two drawbar pins of hardened steel provided by one manufacturer for his tractors and implements. The pins are drilled so that split pins or No. 8 wire can be used to hold them down. They wear exceptionally well. D—The double-jawed drawbar fitted to another manufacturer's tractor. The pin and the hook are chained to the drawbar so that they cannot be misplaced. The weight of the lower chain holds the hook in position so that the pin cannot jump out of the drawbar.

decision was made to move the blocks back a few feet to allow the tractor to move back before attempting another try a foot or so to the right and inside the track. When the blocks were moved and the tractor allowed to run back on them they failed to halt it, and it jumped the blocks. The driver was unable to hold the tractor with the brakes and it turned downhill off the track, skidding the trailer sideways, and overturned to pin him under the mudguard.

10. When he was travelling empty uphill while ploughing a steep siding a driver failed to put the furrow wheel of his wheeled tractor in the furrow. Before he could try again he had to back his machine downhill. It appears that he failed to engage the gears, so that the tractor ran back downhill over a steep bank and overturned into a gully killing him. The wet condition of the paddock would have given the rubber tyres little grip.

11. A farmer failed to stop his machine when he was sweeping a load of grass up to the edge of a silage pit. The complete unit drove over the edge and somersaulted 13ft. 6in. to the bottom, where the driver was pinned under it. The driver was seen to grab both hand brakes as the tractor neared the edge of the pit, but it continued on. It is suspected that the driver, who was an elderly man, suffered a heart failure. Upon examination the tractor was found in gear, the clutch worked quite freely, and the hand brakes worked satisfactorily. The clutch had been inspected shortly before the accident by a serviceman, who said that the clutch lining was only slightly worn, so that it would be unreasonable to think that it would stick.

How 12 Tractor Drivers were Killed in 1951

	Cause of accident	Type of operation	Nature of country
4 track-layers	1 somersaulted	Driving home empty	Very steep gully
	3 rolled over	Logging in bush	Slippery pinch in logging track
		Giant discing	Steep hillside
		Ploughing	40ft. bank into stream
8 wheeled tractors	1 somersaulted	Ploughing	Steep hillside
	5 rolled over	Driving on road	Steep bank into stream
		Trailer work	Moderate hillside
		Cartage work	Shingle pit
		Trailer work	Moderate hillside track
		Sweeping silage	Silage pit
	2 ran over drivers	Driving empty	Flat country
		Trailer work	Hill-country track

12. When a driver of a tracklayer engaged in ploughing did not come home for tea a search was made. He was found wedged under the tractor in 5ft. of water. The machine had gone over a 40ft. bank into a stream.

Fatalities Caused by Equipment

Although a tractor was associated with the death of another farmer, it was not directly responsible when the man met his death while spreading lime from a 4-wheeled trailer. The farmer was riding on the trailer with another man when the pin holding the Y-shaped drawbar sprang out of its socket, allowing the drawbar to fall to the ground. The drawbar acted as a brake, stopping the trailer suddenly and both men fell to the ground, one receiving a broken neck.

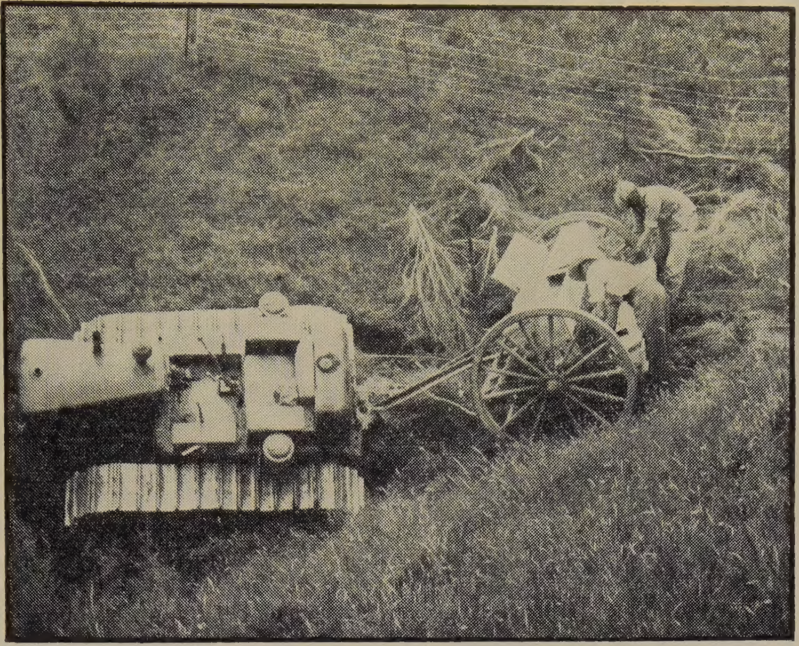
The drawbar pin was smaller than the one supplied for the tractor and was not locked down by a nut or other means.

Other Facts

Age and experience of drivers: Of the drivers whose ages are known, all were in the 20 to 35 age group with the exception of three, who were 15½, 64, and 66 respectively. The 15½-year-old who was killed on a tractor was considered to be quite a competent driver and held a licence issued by his local county council. There is no indication in the reports that any of the drivers were learners; some of the drivers were known to be careful and two were very cautious.

Health of the drivers: One of the drivers had lost the sight of his left eye, and it is felt that this contributed to his death when his tractor rolled into a shingle pit which he was passing on his left side. One elderly driver, who was experienced with tractors, presumably had a heart failure at the critical time when his machine was approaching a silage pit, so that he failed to stop it at the edge of the pit. Another elderly driver, who was knocked down by a tractor as he was opening a gate, was known to have a stiff leg and this may have influenced his ability to sidestep the machine should he have seen it coming toward him.

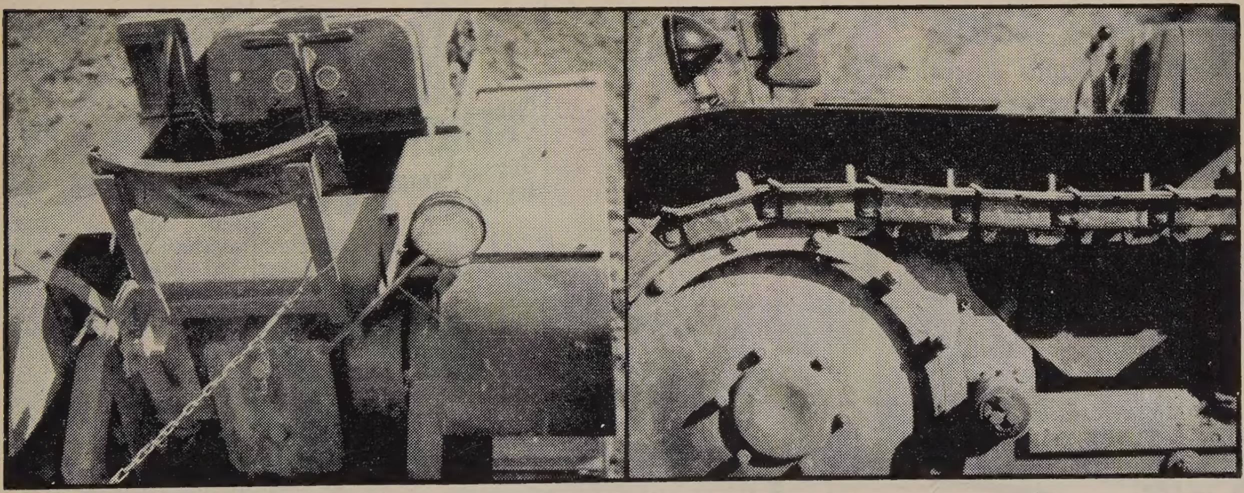
It is felt that there is a moral obligation on drivers who know they have some infirmity preferably to keep off tractors, or at least to exercise extreme care if necessity demands that they should operate one, for they are a danger not only to themselves but to others working nearby. It is for this reason that people known to have certain ailments are not granted a licence to drive a car or truck on the road.



A tractor driver's life often depends on the correct application of brakes. Because the driver of this medium tracklayer did not apply the brakes fully when he dismounted at the top of a gully, the machine started to move forward. He attempted to remount the tractor to reapply them, but was unable to do so. The machine ran downhill to come to rest in the bottom of the gully, luckily without major mishap. The incident serves to illustrate that a driver must at all times concentrate on the job in hand.

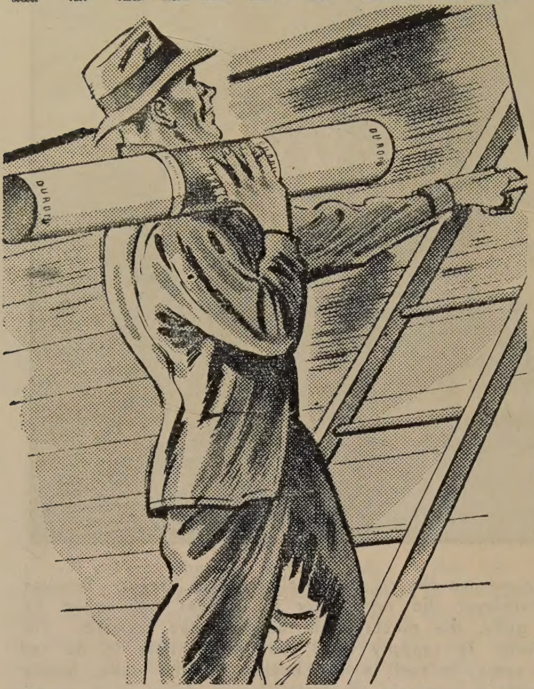
Makes and models of tractors: As with the 18 tractors that killed farmers in 1950, the 12 in 1951 were representative of most of the main makes of tractors manufactured both in U.S.A. and the United Kingdom. There is still no evidence that any one tractor is involved any more than another when their relative numbers in New Zealand are considered. One tractor concerned was a home-made machine converted from an old motor-car.

Mechanical faults: With the possible exception of one machine where the brakes may not have been 100 per cent. efficient all tractors inspected were in good condition and it would be unreasonable to assume that there was a defect in them before the accident that markedly contributed to the accident. Some machines had recently been checked over and serviced by tractor



A driver lost his leg below the knee when his foot slipped off the footrest into the tracks of a similar machine to that shown. The tractor was delivered on the farm without guards between the cockpit and the tracks. These illustrations show the guards fitted by a distributor to all the machines he sells in his territory. He is to be commended for the action he has taken in the interests of tractor safety.

FARMERS! for a better longer lasting roof



buy quality roofing—insist on **DUROID**! Manufactured specially for New Zealand conditions from only the highest quality materials, **DUROID** 2-ply and 3-ply Roll Roofing has the benefit of nearly 70 years behind it. **Consult your roofer or builder for 2- or 3-layer fixing.**

One layer fixing for farm buildings For sheds, machinery shelters, fowl houses and all farm outbuildings, one layer fixing of **DUROID ROLL ROOFING** provides complete weather protection and gives years of hard service—**paint every 3 years with DUROID Roof Coating for lifetime-service.**

DUROID
2 PLY
DUROID
ROOFING
DUROID PRODUCTS LTD
DUROID

Duroid ROLL ROOFING

Now sold in full rolls and handy half-rolls from all leading Hardware Stores, stock and station agents and Builders' Suppliers.

N.Z. Distributors:

DOMINION SALES CORPORATION LTD.

Auckland — Wellington — Christchurch — Dunedin.

Kill

GREEN VEGETABLE BUG, WHITE BUTTERFLY, GRASS GRUB

with NEW, AMAZING, INSECTICIDE

CERTIFIED

by the Plant Diseases Division

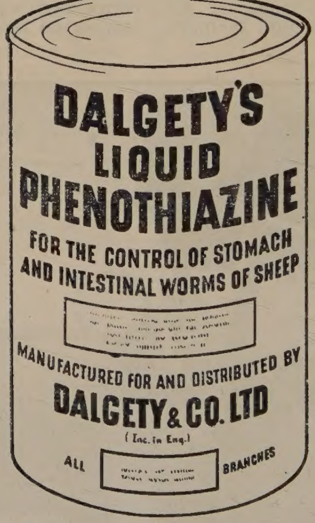
TRIMORT WETTABLE D.D.T.

IN EASY-TO-USE LIQUID FORM

Available from your chemist or seedsman.

TRIMOL LABORATORIES LTD.,
Fitzroy Street, Auckland.

SAFE - ECONOMICAL - EFFECTIVE


DALGETY'S
LIQUID
PHENOTHIAZINE
FOR THE CONTROL OF STOMACH AND INTESTINAL WORMS OF SHEEP
MANUFACTURED FOR AND DISTRIBUTED BY
DALGETY & CO. LTD
(Inc. in Eng.)
ALL BRANCHES

- Ready Mixed
- Stays in Suspension
- Does Not Cake
- Gives Even Doses
- One Stirring Lasts All Day
- For Use With Any Standard Phenothiazine Pistolet or Automatic Gun

Phenothiazine also available in TABLETS OR POWDER.

DALGETY & CO. LTD. **ALL BRANCHES**

The not uncommon habit of treading the furrow slice when potatoes are being dug under unfavourable conditions (above, left) is a hazardous one. There is always the danger that the toe of one's boot may become caught in the fast-moving digger chain. Sleeves and loose clothing may become entangled in the various drives. When a shield provided by the manufacturer was removed (above, right) to allow for adjustment to be made, and not replaced, a worker received multiple injuries to his ribs and arm when his coat sleeve became caught up in the revolving shaft shown. In the illustration at right the shield is shown in place.

firms' representatives, and others were relatively new and had done little work.

Traction Important

A review of the 18 tractor fatalities in 1950 (detailed in the November 1951 issue of the "Journal") and the 12 in 1951 shows that in nearly one quarter of the cases lack of traction on hillsides was the primary cause of accidents. It is all too evident that the modern tractor fitted with rubber tyres has not sufficient traction in the wide range of conditions under which the machines operate. Experienced operators know that rubber tyres will not grip on frozen ground, on frosty ground, or under the slippery conditions immediately after frosty or frozen ground thaws. Accordingly, they keep off such ground. They fit grippers to their rubber-tyred machines to gain additional traction, but even so an experienced man will not venture on to frozen hillsides with either a wheeled tractor fitted with grippers or a tracklaying machine. The chances of its going into a skid or a slide and becoming out of control are too great.

It is evident, however, that some drivers are not aware that rubber tyres lose traction on pastures with a high clover content, on the dry stubble of a hay or grain field, and on browntop pastures in autumn when the lower herbage of the plants is saturated with water. Under such conditions it is imperative to fit rubber-tyred tractors operating on hillsides with grippers to increase the traction and so to make them safer. Grippers will hold a rubber-tyred machine on a hillside when the brakes are applied when normally it would go into a skid. In this way many accidents are avoided.

There are several types of grippers on the market in New Zealand and perhaps the most suitable type is that requiring the minimum of adjustment to get grippers from the "up" position to the working position of the required depth. A driver who has to undo and do up over 2 dozen bolts to get his grippers into working position has his judgment of whether or not to set them in working position influenced in no small way. However, whatever grippers are fitted, they should be in the working position when conditions are at all doubtful.

A mishap to a tractor and header illustrates this point. The unit was harvesting browntop on a moderate hillside when it became out of control and skidded over a bank into a gorse-filled gully to pin and injure the driver; luckily the injury was not fatal. In this case, when the traction of the rubber tyres was inadequate, grippers were fitted to the tractor, but they were in the "up" position.

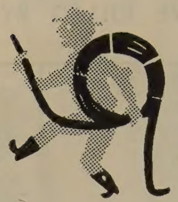
A bench on a hillside of which the slope is 30 degrees. If the bottom track of a tracklayer dropped over this bench, it would fall 10in. to increase the angle to 35 degrees. If a 6in. furrow had been ploughed below the bench on the previous round, dropping over the bench would put the tractor on an angle of approximately 39 degrees and it would most likely roll over.

4 facts you should know about

CONTOUR PIPE

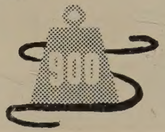
Manufactured from "Alkathene".

To say the least of it Contour Pipe is revolutionary. Its advantages over heavy metal piping are obvious and many, but here are four of the most important.



1 **Contour Pipe** is amazingly light — eight times lighter than iron. It can be easily sawn or cut with knife or pipe cutters.

2 **Contour Pipe** is exceptionally strong, and its unique qualities make it immune to corrosive action from soil, caustic, skimmed milk and most acids.



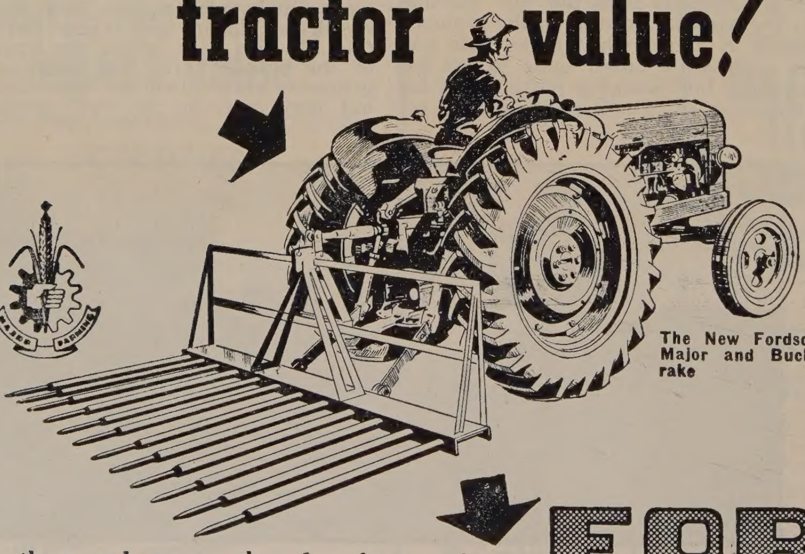
3 **Contour Pipe** can be connected to pumps, troughs, galvanised pipe etc. Bursting strength is as high as 900 lbs. per square inch. It will not burst under freezing conditions.

4 **Contour Pipe** can be supplied in 50ft., 100ft., 200ft., 300ft., and 500ft. lengths.

ANOTHER *Garnite* PRODUCT

NEILL, CROPPER & CO. LTD.
Sole Selling Agents: Plastics Division, N.Z. Glass Mfrs. Co. Pty. Ltd.,
AUCKLAND - WELLINGTON - CHRISTCHURCH - DUNEDIN.

World's greatest tractor value!



The New Fordson Major and Buckrake

ON RUBBER
£695 Deposit as low as £232
(with electric light, starter, belt pulley, power take-off)

ON STEEL WHEELS
£622 Deposit as low as £208
Hydraulic Lift and 3-Point Linkage (optional equipment—extra).

Convenient payments (both tractor and implements) under the confidential A.F.C. Purchase Plan.

VISIT THE FORD PLANT. Visitors to the Ford Plant at Lower Hutt are welcome. Conducted tours through the Plant commence daily at 10 a.m. and 3 p.m., Monday to Friday. Eastbourne 'buses stop at the gates.

- **6 forward, 2 reverse speeds**
- **New swinging drawbar**
- **New O.H.V. engines, petrol and kerosene**
- **New grouped controls**
- **New easy steering**
- **New hydraulic implement control**

these and many other fine features in
THE WORLD'S NEWEST TRACTOR

FORDSON MAJOR

FORD MOTOR COMPANY OF NEW ZEALAND LIMITED LOWER HUTT

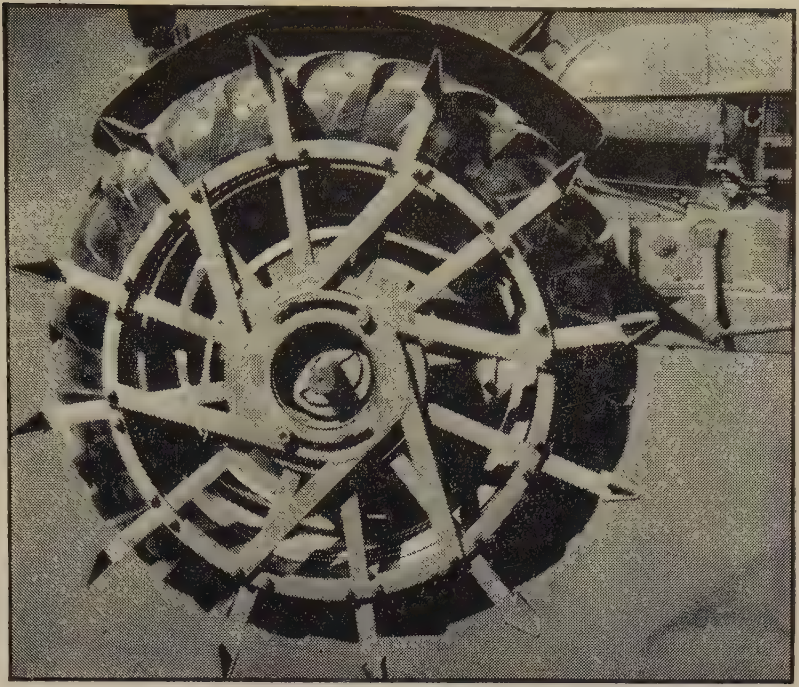
Grippers should never be used to take a tractor uphill under conditions where it would normally skid and refuse to go higher. If so used, grippers will enable a tractor to climb up a hill of such steepness that it is in extreme danger of somersaulting backward. One fatality has already been recorded through such misuse of grippers.

A tracklayer has far superior traction to a rubber-tyred tractor fitted with grippers, but even tracklayers lose traction when the cleats on the grouser plates become worn. In such cases either the plates should be replaced with new ones, if badly worn, or the cleats should be built up by welding and the leading edges hard-tipped to reduce wear.

Brakes Essential

The brakes of tractors, whether wheeled or tracklaying, operating on hill country should at all times be in first-class condition, for it is on them that a driver's life often depends. The cost of relining or renewing the brake bands of a tractor is such a small price to pay for the safety provided by good brakes that there is no excuse for tolerating poor brakes. The small service charge can be regarded as a small premium on a life insurance policy. Brakes, however, are a liability if they are not aligned correctly on each wheel or track. A machine with one brake gripping harder than the other will pull to one side, and this can easily involve a driver in an accident on hill country or in fields bordered by rivers or streams.

Failure to apply the brakes correctly when a tractor was stopped on sloping or uneven ground cost the lives of two tractor drivers in 1951. In one case it appears that they were not applied hard enough to hold the tractor and



Above—A set of grippers should be fitted on every rubber-tyred tractor operating on hill country, because they improve the traction of the machine considerably and a driver's life often depends on his ability to stop the tractor suddenly without having it go into a skid. Below—Safe storage of petrol, diesel fuel, oil, and greases is essential if fires and explosions are to be prevented on farms. This storage shed is well away from other buildings and has a loose-boarded floor to allow the escape of fuel vapours, which, being heavier than air, would normally collect on the floor and form an explosive mixture with the air. In addition, a suitable fire extinguisher is kept handy.

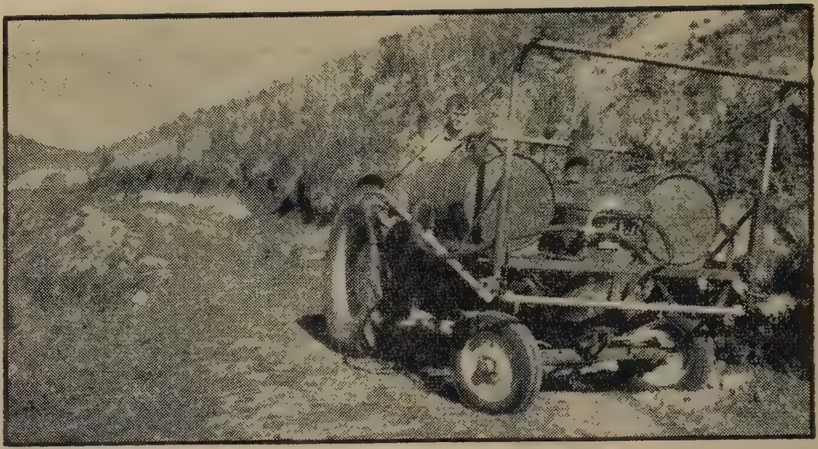
Below—In this demonstration at a tractor safety field day a sack of soil is seen falling off the seat of a field roller to fall in front of it and be run over. Two children who were riding on rollers were killed in this way in 1950.

Farm and Tractor Fatalities 1939-51

In the past 13 years tractors have caused the deaths of 77 New Zealand farm workers, and in recent years deaths caused by tractors have represented a high percentage of total farm fatalities as the following figures show:—

	Total farm fatalities	Fatalities caused by tractors	Number of agricultural tractors
1939 ..	21	1	9,639
1940 ..	35	3	11,278
1941 ..	29	4	12,516
1942 ..	27	4	13,967
1943 ..	25	8	Not available
1944 ..	31	4	Not available
1945 ..	28	5	Not available
1946 ..	34	5	18,940
1947 ..	26	5	21,156
1948 ..	Not available	Not available	23,423
1949 ..	34	8	27,447
1950 ..	55	18	34,684
1951 ..	47	12	40,310

in the other it is very doubtful if they were applied at all. Brakes are fitted on a tractor so that it may be slowed down, to assist the steering of it, or to hold it stationary when parked, and failure to apply them when a machine is stopped for a time, however short, is to break one of the most important rules of tractor safety.



When a tractor is parked on a hillside track the brakes must be applied hard. It is wise, too, to turn the front wheels in against the bank, so that if the machine should move, no harm will result. This tractor was being used to pump spray to two men spraying weeds on a very steep hillside.

Non-fatal Tractor Accidents

The following list of non-fatal accidents with tractors in 1951, though incomplete, as many accidents are not reported, is remarkable because it is quite clear that many of the men missed losing their lives by a hair's breath when their machines overturned:—

1. A driver received a broken leg when his tractor overturned.
2. When his machine ran off the road and overturned into a drain a tractor driver received a lacerated arm.

Traction on hillsides, an important phase of tractor safety, is demonstrated at the safety field days. The illustration shows a rubber-tyred tractor going into a skid on a slope of just under 20 degrees. A rubber-tyred tractor with grippers fitted and a steel-wheeled tractor were both able to stop on this hillside when the brakes were applied.

3. A tractor being used in the discing of gorse overturned and the driver was seriously injured.
4. A driver received serious burns from his petrol-soaked clothes when his tractor overturned and the petrol ignited.
5. While topdressing steep country a driver received a broken leg and crushed pelvis when his tractor rolled on him.
6. A driver's hip was broken when his machine overturned.
7. A man received serious injuries when a tractor ran over him while he was attempting to get at the controls.
8. A driver operating a small track-laying tractor that had inadequate guards between the cockpit and the tracks lost his leg below the knee when his foot slipped off the foot-rest into the tracks.
9. A tractor went over a bank into a gully and was smashed beyond repair, but the driver jumped clear.
10. The driver received concussion when a tractor being used for transport purposes left the road, mounted a bank, and overturned.

Unfortunately no details other than those given are available, but it will be readily recognised that but for a slim chance the list of fatal tractor accidents in 1951 might have been longer.

Operators of tractors, wherever they are—whether on flat, rolling, or steep country—are urged to exercise extreme care at all times. Only in this way will the terrific toll of farmers these machines are taking be reduced.

Remember: Accidents DON'T HAPPEN—they are caused.

Show Dates

THE following are dates and venues of A. and P. shows up to the end of February:—

January

1 January—Nuhaka A. and P. at Nuhaka.

10 January—Blueskin A. and P. at Waitati.

10 January—Rotorua A. and P. at Rotorua.

16 and 17 January—Wairoa County A. and P. at Wairoa.

17 January—Waikouaiti A. and P. at Waikouaiti.

*24 January—Central Hawkes Bay A. and P. at Waipukurau.

24 January—Palmerston and Waihemo A. and P. at Palmerston.

*27 and 28 January—Feilding A. and P. at Feilding.

*30 and 31 January—Horowhenua A. and P. at Levin.

31 January—Waiau A. and P. at Tuatapere.

31 January—North Kaipara Agricultural Association at Paparoa.

February

2 February—Horowhenua Ram Fair at Levin.

4 February—Marton District A. and P. at Marton.

6 and 7 February—Ohura A., P., H., and I. at Nihoniho.

7 February—Rodney Agricultural Society at Warkworth.

7 February—Rangitikei A. and P. at Taihape.

7 February—Woodville A. and P. at Woodville.

7 February—Golden Bay A. and P. at Takaka.

7 February—Hukerenui A. and P. at Hukerenui.

*7 February—Clevedon A. and P. at Clevedon.

10 and 11 February—Dannevirke District A. and P. at Dannevirke.

13 February—Dannevirke Ram Fair at Dannevirke.

13 and 14 February—Taranaki Metropolitan A. and P. at New Plymouth.

*13 and 14 February—Taumarunui District A. and P. at Taumarunui.

*13 and 14 February—Buller A. and P. at Westport.

14 February—Waitemata A. and P. at Waiwera.

14 February—Pahiatua A. and P. at Pahiatua.

14 February—Tauranga A. and P. at Tauranga.

18 February—Te Awamutu A., P., and H. at Te Awamutu.

20 and 21 February—Masterton A. and P. at Masterton.

20 and 21 February—Franklin A. and P. at Pukekohe.

*21 February—Murchison A. and P. at Murchison.

21 February—Northern Wairoa (Arapohue) A. and P. at Mititai.

21 February—Waiapu P. and I. at Ruatoria.

21 February—Banks Peninsula A. and P. at Little River.

21 February—Te Puke A. and P. at Te Puke.

24 February—Otorohanga A. and P. at Otorohanga.

25 February—Opotiki A. and P. at Opotiki.

26 February—Matamata A. and P. at Matamata.

*27 and 28 February—Wellington and Hutt Valley A. and P. at Upper Hutt.

28 February—Putaruru District A. and P. at Putaruru.

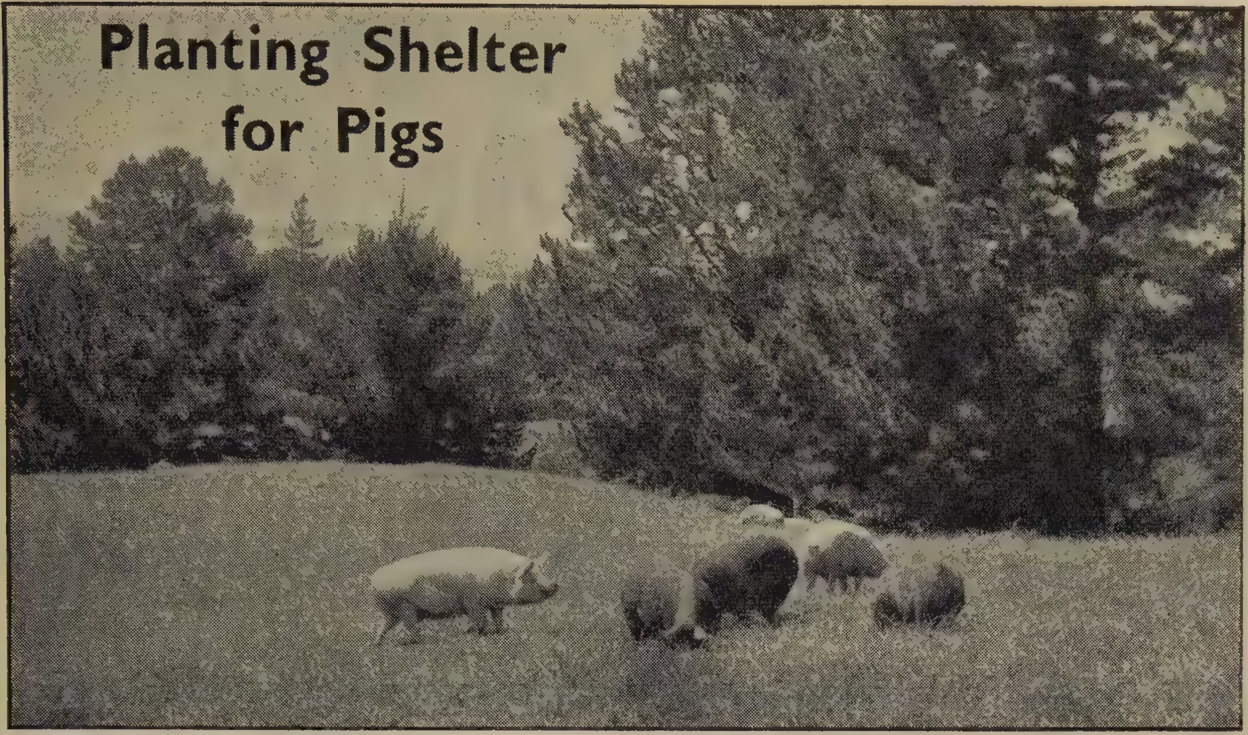
28 February—Waimarino A., P., H., and I. at Raetihi.

28 February—Whakatane and Rangitaiki A. and P. at Whakatane.

28 February—Maniototo A. and P. at Ranfurly.

* The Department of Agriculture exhibit will be staged at this show.

Planting Shelter for Pigs



HEADING PHOTOGRAPH: Breeding sows grazing in well-sheltered paddock. H. E. Clark photo.

SHELTER and shade are important to pigs. Care is necessary in the selection of trees and hedge plants for this purpose and in this article the questions of what, where, and how to plant shelter for pigs are dealt with by J. P. Burrell, Assistant Farm Forestry Officer, and I. H. Owtram, Extension Officer in Pig Husbandry, both of the Department of Agriculture, Wellington.

PIGS, as those who have had much to do with them know, do not like wind or draughts. As the comfort of the pigs has a considerable influence on their progress to the final goal of finished porkers or baconers, the provision of adequate shelter and shade for them is a paying proposition for the farmer.

Shelter for pigs can be said to fall into three groups: First, main shelter belts of tall-growing trees to act as a windbreak for the piggery and pig paddocks from the prevailing wind or winds; secondly, comparatively low shelter belts to provide shelter in the pig paddocks; and thirdly, individual trees planted in the paddocks to provide shade.

Main Shelter Belts

The main shelter belts naturally will form part of the shelter plan for the whole farm, and this planning of shelter is important and should be given attention, especially on the numerous farms that have come into being in recent years through subdivision of properties, particularly through rehabilitation farm settlement. Advice on planting farm shelter can always be obtained from the farm forestry section of the Extension Division of the Department of Agriculture.

The most important point is to plant shelter belts that will give permanent shelter down to the ground. This involves planting the correct variety of trees and fencing them off properly from stock. There is always a draught under a shelter belt that has had the bottom eaten out of it or that consists of varieties of trees that do not maintain growth at ground level. For pigs, draught is most undesirable and very often is fatal.

Soil conditions, particularly the dampness of the situation, and exposure to salt-laden winds must be taken into consideration when selecting varieties to plant. No high shelter belt should be within 100yds. of the pig houses, etc. This is a safe distance to eliminate excessive shading and danger from wind-blown broken branches.

In good-rainfall areas with well-drained soils, near perfection can be reached in high shelter, and the selection of species is wide. If possible, the shelter belt should run north to south, as this cuts down the amount of shade cast on the paddocks. However, the direction of the prevailing wind and the position of existing fences are the major considerations.

Suitable Species

When the shelter belt is one of the main dividing windbreaks on the farm tall trees such as eucalypts, Lombardy poplars (*Populus nigra* var. *stricta*), or Oregon pine (*Pseudotsuga taxifolia*) combined with Lawson's cypress (*Chamaecyparis lawsoniana*) are excellent. The best varieties of eucalypts to use are *Eucalyptus macarthuri*, *E. saligna*, or *E. maideni*, unless the area is affected by heavy frosts, when *E. viminalis*, *E. gunni*, and *E. gigantea* are preferable.

When the high shelter for the piggery is only one of the subsidiary farm breaks a single row of Lawson's cypress can be used. This can be as close as 50yds. from the piggery.

Unfortunately Lawson's cypress will succeed only under a fairly restricted range of conditions. In areas where it is affected by blight, notably the Waikato, Bentham's cypress (*Cupressus benthami*), Japanese cedar (*Cryptomeria japonica*), or *Thuja plicata* can be substituted.

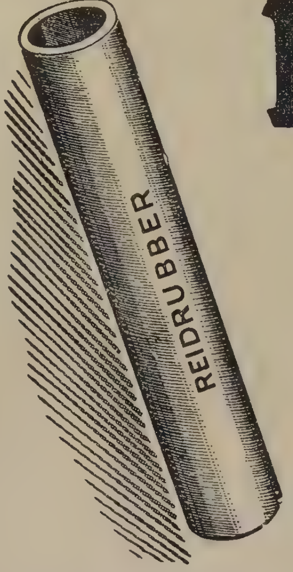
For wet areas Lombardy poplars and eucalypts, especially *E. macarthuri*, *E. saligna*, or *E. botryoides*, can be used as top shelter. In these areas Bentham's cypress should replace Lawson's cypress as ground shelter, as the latter will not tolerate "wet feet". *C. japonica* can also be used for ground shelter. One of the most efficient windbreaks for wet or average ground is a combination of Lombardy poplar and pampas grass (*Cortaderia selloana*). This is a particularly useful belt on dairy farms or other valuable country, as it occupies much less ground than most high shelter belts.

On country that tends to be dry Bentham's cypress will survive and can be combined with *Pinus radiata* or Lombardy poplar. If dryness is accompanied by heavy

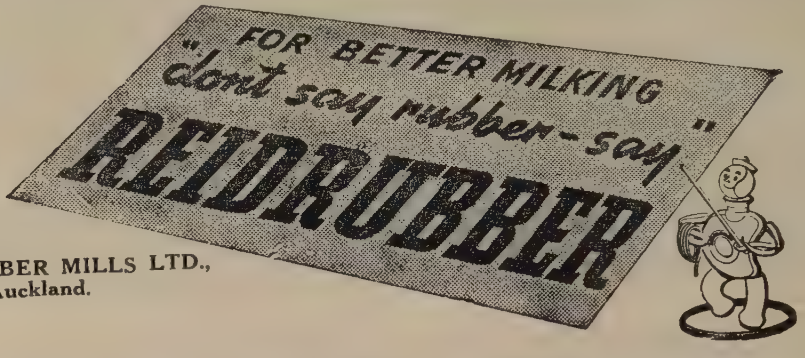
EQUIP YOUR MILKER WITH

Reidrubber

INFLATIONS AND TUBING

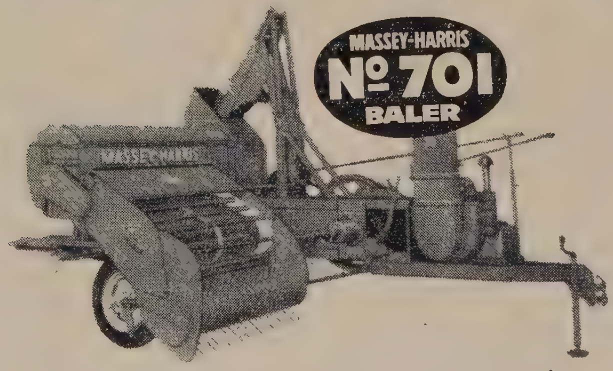

REIDRUBBER

Superior quality makes more farmers every year change to Reidrubber Milking Rubberware for greater service and satisfaction.


FOR BETTER MILKING
"don't say rubber-say"
REIDRUBBER

REID NEW ZEALAND RUBBER MILLS LTD.,
Great South Road, Auckland.

BE READY for NON-STOP HARVESTING


MASSEY-HARRIS
Nº 701
BALER
MASSEY-HARRIS

This popular No. 701 Baler is a fully automatic, twine-tier, slicer, pick-up baler, producing bales 14 x 18 x 37 inches.

Output under average conditions is 3 to 4 tons per hour, although 6 to 7 tons per hour are possible.

Powered by a 21 b.h.p. four-cylinder petrol engine. Pick-up is a 3-bar type, 52 inches wide with removable teeth.

MASSEY-HARRIS
Nº 726
COMBINE

The single 56 b.h.p. motor on the Massey-Harris No. 726 Combine propels the machine and powers all the working parts—and does it on about half the fuel needed to operate separate tractor and combine motors. "Balanced separation" means grain is delivered into the grain tank with less loss than has ever before been possible by any threshing combine. In all ways you obtain MORE GRAIN AND MORE VALUE when you make yours a Massey-Harris.

MASSEY-HARRIS CO LTD

Head Office: CHRISTCHURC
Branches: Auckland, Palmer
North and Dunedin.
Agencies Everywhere.
(P. & D. Duncan Implements
sold exclusively by Massey-H
Co. Ltd.)

[*H. E. Clark photo.*

Concrete feeding platform for pigs in a well-sheltered position.

frosts in winter, *Pinus murrayana* will do well and gives more efficient shelter than *P. radiata*. *E. gunni* can be used instead of pines. On country that is really dry *Cupressus arizonica* shows promise as a ground shelter tree in a high break or a single-row medium break.

When the farm is exposed to salt-laden winds the selection of suitable varieties for shelter presents difficulties. Two species of eucalypts grown in New Zealand will withstand the effect of salt. They are *E. botryoides* and *E. obliqua*. These can be combined with macrocarpa (*Cupressus macrocarpa*) or with pampas grass. *P. radiata* or *P. muricata* will also stand salt winds and can be used combined with a boxthorn (*Lycium ferocissimum*) hedge, but only as a last resort.

Planting Distances

The following are recommended planting distances:—

Species	Distance from fence	Distance from other species	Distance apart
Lawson's cypress	12	10	10
Bentham's cypress	10	8	9
Macrocarpa	10	8	9
Cupressus arizonica	10	8	8
Eucalypts	8	8	8
Pines	9	8	8
Lombardy poplar	6	5	5
Oregon	10	9	9
Cryptomeria japonica	9	8	8
Thuja plicata	10	8	9

Lawson's or Bentham's cypress can be combined with eucalypts in a single line, that is eucalypts and cypress alternately with 6ft. between trees. When poplars and pampas grass are planted together the poplars should be 6 to 8ft. apart with the pampas grass between them.

Low Shelter Belts

To be really effective low-growing shelter hedges round pig paddocks must be draught proof, and in selecting suitable varieties to plant for this purpose more care is necessary than with main shelter. Any hedge that requires regular trimming should be avoided, because of the maintenance work involved. Varieties having large thorns such as boxthorn and barberry (*Berberis vulgaris*), seedless or otherwise, can cause trouble through pricks and scratches, particularly on the pigs' feet. As pigs are very prone to infections that gain access through breaks in the skin, anything that is likely to cause them should not be used.

Boxthorn and barberry tend to be favoured because they do not require fencing against sheep and cattle, which will not eat them because of the thorns. However, pigs will root out young boxthorn and barberry plants, so if these are used, they should be properly fenced until well grown, or the pigs must be efficiently ringed.

Three of the best species for low shelter are pampas grass, bamboo, and flax (*Phormium tenax*). They also have the advantage of being ornamental. Pampas grass can be far more than a shelter belt for pigs if a considerable area is planted, as it then

Pigs in pampas grass plantation. [*H. E. Clark photo.*

["New Zealand Farmer" photo.

Bamboo shelter in piggery.

forms when well grown a most efficient pig house.

All the plants suggested require to be planted in a fairly wide belt and must be fenced off from the pigs. Fencing of hedges can be used as a method of keeping them the right width. The procedure is to decide the width of hedge required, calculate how far an animal can stretch its neck, add at least 1ft. to this distance, and fence accordingly.

Planting Distances

The following is a guide to planting distances for low shelter species:—

	Apart ft.	No. of rows
Pampas grass ..	6 to 8	1 or 2
Flax	6 to 8	2 or 3
Bamboo	5	1

Fruit trees planted in the piggery provide shade when it is required and the pigs clean up the windfalls. Protection of the trunks from the pigs is essential.

Shade

Shade from the sun is very necessary for pigs, but there must be no draught. Large evergreen trees, particularly conifers, are useless, as there is always a cold draught under them. Deciduous trees, planted in the paddocks well away from boundary fences, should be used. For the first few years they must be stoutly protected from the pigs; otherwise their chance of survival is very small. Fruit trees are good, as they do not grow very large. As fallen fruit is immediately disposed of by the pigs, reinfection of trees from diseased fruit on the ground is avoided. Any variety of fruit can be used, particularly peaches, nectarines, apples, or plums, but pears, owing to their upright growth, are not very suitable. Walnut trees are also good.

Fruit trees should have a high standard so that the pigs are not tempted to climb them to get the fruit. Fruit trees in the pig paddock are very ornamental when in bloom, provide good shade from the sun in summer, and in winter, when they are bare of leaves, do not make a cold, draughty spot for the pigs.

Weeping willows also make good shade trees, and other varieties could be used.

Placing Orders for Trees

Although this is not the time of year when planting of shelter is done, it is most important to plan well ahead and to order the necessary trees and hedge plants to get delivery in good time for planting. For all the varieties mentioned this is July and August, except in localities where the ground is likely to be frost-bound, where planting can be done in September. Trees should be about 1ft. high when planted.

Pigs are very vulnerable to cold winds and draughts, as they have little natural protection against them in the form of hair or wool. If they are cold, they will use the food they eat to keep up their body temperature instead of using it to put on weight. Anything that can be done to protect pigs enables them to make better use of their food. Planting shelter is a very good way of doing it; it also adds to the attractiveness of the piggery and makes the whole setting pleasant, a feature that is often neglected.

Whether pigs are run on the open-air system or housed, shelter belts around the paddocks, including high shelter about 100yds. away, will help to restrict air movement and keep pigs warm. One advantage of making out an order for trees now is that shade trees are less liable to be overlooked. These are just as valuable as shelter trees in assisting efficient conversion of food, because the pig which becomes distressed in the heat is a very poor feed converter. Unless a farmer is prepared to put in a properly designed concrete wallow, the provision of some form of shade is essential in New Zealand if a piggery is to be operated efficiently.

◆

HEADING PHOTOGRAPH: A crop of barley in the windrow in Canterbury. Green and Hahn Photography Ltd. photo.

Malting Barley Variety Trials in Ellesmere County

FOR a number of years malting barley variety trials have been carried out in Ellesmere County by the Department of Agriculture in conjunction with co-operating farmers. Because of its soil and climate Ellesmere County is admirably suited to the growing of malting barley, and in this article P. R. Barrer, Instructor in Agriculture, Department of Agriculture, Christchurch, shows the importance of this crop in the county and discusses the yields of the main varieties in the trials in relation to the malting quality of the varieties.

THOUGH there are a number of dairy farms on the heavier and wetter land of Ellesmere County and sheep farms on the lighter and stonier land, arable farming is the predominant pattern; approximately 40 per cent. of the holdings obtain the greater part of their revenue from cash cropping.

The land utilisation table in the next column shows the importance of these cash crops, which in 1949-50 took up 17 per cent. of the occupied area.

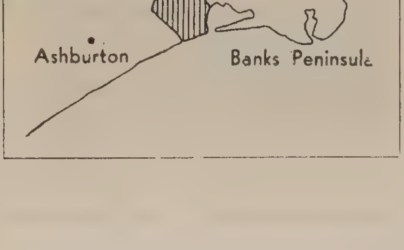
LAND UNDER OCCUPATION AND LIVESTOCK NUMBERS IN ELLESMERE COUNTY 1949-50.

	Acres
Area in Cash Crops	
Barley for threshing	8,039
Wheat for threshing	4,996
Oats for threshing	1,119
Peas for threshing	3,763
Potatoes	983
Others	105
	19,005
Area in other Crops, Grasses, etc.	
Supplementary fodder crops (including cereal crops fed off)	5,335
Grasses and clovers	64,060
Lucerne	1,394
Plantations, private gardens, etc.	1,673
Fallow	3,888
Unimproved land	19,111
Total area occupied	112,242
Livestock Numbers	
Breeding ewes	75,179
Total sheep	101,682
Total cattle	9,443
Dairy cows in milk	5,107

Importance of Barley in Ellesmere

Of the cash crops grown in the county barley has over the past 10 years replaced wheat in the position of greatest acreage. In the 5-year period 1936 to 1940 the average acreage of barley was 31 per cent. of the area in cash crops and wheat 49 per cent.; in the period 1946 to 1950 barley occupied 45 per cent. of the acreage and wheat 25 per cent.

At one time Ellesmere County grew nearly a quarter of the total barley acreage in the Dominion, and it is probable that if the area of feed barley grown for seed could be deducted from the total acreage, the county would still be shown as growing 20 to 25 per cent. of the Dominion's acreage of malting barley. For the period 1946 to 1950 the county grew 21 per cent. of the Canterbury barley acreage and



These World-famous BRITISH Tractors are fitted with

C.A.V.

Fuel Injection Equipment

DAVID BROWN	Trackmaster 30 Trackmaster Diesel 50 Cropmaster Diesels 34 and 50
FOWLER	Challenger I, III and VF
VIVIAN LLOYD	Dragon
VICKERS	VR180
FERGUSON	TE-F
MARSHALL	Field Marshall
TURNER	Yeomen of England
MASSEY HARRIS	744D
NUFFIELD	M4

YOU CAN GET ADVICE OR SERVICE FROM ANY OF THESE

C.A.V. **SERVICE AGENTS**

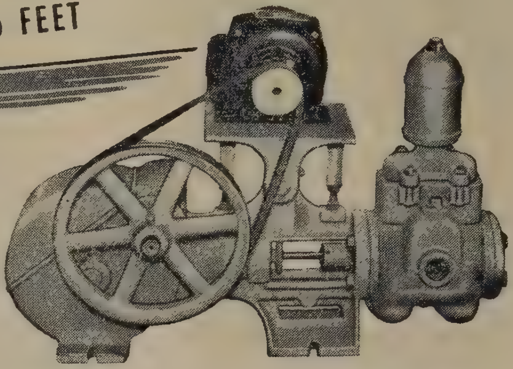
	Phone
Whangarei Engineering Co., **Whangarei**	2639
Joseph Lucas (N.Z.) Ltd.,	
75-77 Beach Road, **Auckland**	34-330 (3 lines)
Unity Buildings, **Hamilton**	1618
Grey Street, **Tauranga**	1010
Commerce Street, **Whakatane**	124
L. M. Silver & Co. Ltd.,	
263 Victoria Avenue, **Wanganui**	2632
King Street, **Palmerston North**	5989
Jervois Quay, **Wellington**	54-555
Wooff & Salvesen Ltd.,	
17-19 Lichfield Street, **Christchurch**	37-607
Giles & Duncan	
52 Theodocia Street, **Timaru**	1321 M
Wooff & Salvesen (Dunedin) Ltd.,	
260 Cumberland Street, **Dunedin**	13-642
Ross Mitchell Ltd.,	
Don Street, **Invercargill**	930

LATEST ADDITION TO OUR BIG RANGE

"DAVIES 500"

FOR VERTICAL SUCTION LIFT UP TO 25 FEET

PUMPS UP TO 500 GALLONS PER HOUR



Ideal for direct water supply, where no storage is required. Automatic lubrication and completely self-operating. Vacuum and pressure-tested, and fully guaranteed. Motor available as extra.

WRITE TO THE MANUFACTURER FOR COMPLETE DETAILS

D. H. DAVIES & CO. LTD.

404 Broadway, Newmarket, Auckland, Phone 22-458

Manufacturers of Skim Milk Pumps, Deep Well Gearings, etc.

AGENTS THROUGHOUT NEW ZEALAND

For

PERMANENT PASTURE IMPROVEMENT

Topdress with

BASIC SLAG

BELGIAN BASIC SLAG SYBESCO

Basic Slag is a remarkable improver of permanent grass lands, promoting clover development and the best grasses. Of the total phosphate present in Basic Slag, 85-90% is immediately available. Order from your fertiliser merchant — regular shipments arriving.

Chevallier.

Spratt-Archer.

Golden Archer.

14.4 per cent. of the Dominion acreage. However, as the average yield of barley in Ellesmere over the same period was 46.1 bushels per acre against the Canterbury average of 38.1 bushels and the Dominion average of 38.0 bushels, the importance of the district as a barley producer is greater than the acreage figures indicate.

The trials carried out by the Department of Agriculture have been conducted with the object of trying out under normal farming conditions promising new varieties and selections in comparison with the standard varieties grown. The selection of promising varieties starts with the Crop Research Division of the Department of Scientific and Industrial Research and from their records the Field Crop Committee (an organisation of all interested research and field workers) selects those varieties worth full-scale field trial.

Barley Varieties

In the last 7 or 8 years there has been a revolutionary change in the varieties of malting barley grown. Thus in 1943-44 Chevallier was grown on 46 per cent. of the area devoted to malting barley and Spratt-Archer and Plumage-Archer were each grown on 23 per cent. Those varieties had been the main ones for some years, and the varieties Research and Golden Archer were then not grown commercially. In 1951-52 the variety Research occupied 59 per cent. of the malting barley area in Canterbury and North Otago, Golden Archer 24 per cent., and Kenia 12 per cent.; Chevallier was grown on only 2½ per cent. and Plumage-Archer and Spratt-Archer only 1 per cent. and 1½ per cent. respectively of the area. There appears to be a further trend now under way in a reduction of areas of Research and Golden Archer and an increase in the area of Kenia.

It has been the aim of the Department to carry out a barley variety trial each year in the Ellesmere district. Yield results in the last 6 years are summarised in the table on page 483.

The only two varieties which were continued throughout the period were Research and Golden Archer After the first three trials the varieties Chevallier and Spratt-Archer were discontinued, results showing that they yielded some 3 bushels less per acre than Golden Archer or Research over this period.

The final comparison of the average of the last 4 years' trials gives figures of importance to farmers in the Ellesmere district. The variety Research upheld its popularity by outyielding Golden Archer over the period by 4.4 bushels to the acre. Kenia yielded less than Research by 1.5 bushels per acre. Culture 9, which yielded 1.6 bushels less than Kenia, has not been released commercially in view of the fact that it is similar in

Culture 9.

Research.

Kenia.

WE SUPPLY
THE BEST MATERIALS FOR Farm Buildings

General Construction Requirements

- CEMENT
- Concrete Fence Posts
- Waratah Steel Fence Posts
- Field Tiles
- Earthenware Pipes and Fittings
- Concrete Drainage Pipes

ROOFING

- Corrugated "Fibrolite"
- Flat "Fibrolite" Sheets
- Corrugated Aluminium
- Corrugated "Perspex"
- "Duroid" Fabric Roofing
- Marseille Pattern Earthenware Tiles

DURACOTE Portland Cement Paint

THE FINAL TOUCH TO A SOUND JOB.

- Forms a bond with all concrete and masonry
- Easy to apply—economical weather-resistant

POST THIS COUPON
Messrs. Winstone Ltd., P.O. Box 395, Auckland.
Please send me full information on
....
(Indicate lines required)
Name ....
Address ....

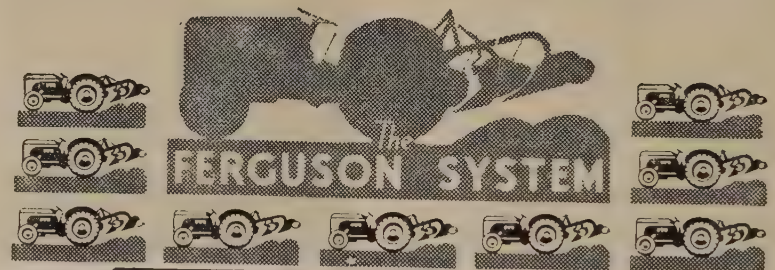
WINSTONE LTD.
69-77 QUEEN STREET, AUCKLAND.
and at
Wellington, Hamilton, Taumarunui, Plimmerton,
Hutt City, Palmerston North, Wanganui, Blenheim.

MILKEEZE
Makes Milking a Pleasure

HEALS
sore, cracked Teats and Udders.
CANNOT TAINT MILK
Sold in 1 lb., 4 lb.
and 36 lb. Tins
At Chemists and Stores.
G. N. SIMES LTD., NELSON

SPEEDWAY
LOW & HIGH PRESSURE
OIL BURNING BOILERS

Write for free illustrated catalogue to
Speedway Products Ltd.,
26 Albert St., Auckland.
South Island Distributor:
A. H. Turnbull & Co. Ltd.,
Christchurch.
S8-1-3



FERGUSON
The ONLY Tractor with these
5 exclusive advantages!

- Traction without built-in weight.
- Penetration of implement without weight.
- Finger-tip hydraulic depth control.
- Front end kept down.
- Automatic protection of tractor and implement against hidden obstructions.

C. B. Norwood Ltd., Box 1292, Wellington.

Header harvesting of barley in Canterbury.

many respects to Kenia but with a poorer malting quality and slightly lower yield.

Comparison of Varieties

The rapid rise to popularity of Research has resulted partly from its yielding ability, but more from its suitability for harvesting with the header harvester, either out of the windrow or by direct heading. This variety has not been popular with the malting trade, however, because of the generally inferior results obtained from it in comparison with those from other varieties. A more uniformly maturing selection made from Research has a slightly higher yield and a higher predicted malt extract than the present commercial lines. It is now in the process of being submitted to full-scale malting trials.

Golden Archer has a malting quality superior to that of Research, and for this reason has been favoured by maltsters. The newly introduced variety Kenia has come rapidly into prominence. It is as suitable for harvesting with the header harvester as is Research and its predicted malt extract in the variety trials has been the highest of all varieties tried. Its malting quality has been confirmed by the results from commercial malting, and an appreciable extension of the acreage to this variety can be expected. Observations over a number of variety trials in different localities suggest that Kenia is the more suitable variety in the heavier barley-growing soils and Research the more suitable on the lighter soils. Research is more prone to lodging, but Kenia is more susceptible to neck-break damage.

Value of Careful Harvesting

The malting trade has pointed out that since the advent of the header harvester there has been a marked fall in the malting quality of barley. Part of this fall in quality is due to the preponderance of the variety Research, with its low malting quality, but most of it is due to carelessness in heading. It is not the purpose of this article to discuss fully the points to be observed in threshing malting barley. This has frequently been brought to the notice of farmers in the "Journal" and elsewhere. Reference on these points may be made to Bulletin No. 266 of the Department of Agriculture or Bulletin No. 1 of the Canterbury (N.Z.) Malting Co. Ltd. It is intended here merely to point out that as a result of trial work it is possible to grow varieties of barley that are high yielding and of potentially good malting quality, but that the value of such a conclusion is lost if, as a result of careless harvesting, the malting quality of the barley is ruined.

YIELDS OF ELLESMERE BARLEY VARIETY TRIALS 1945-46 TO 1950-51 IN BUSHELS PER ACRE

Year	Location	Soil type	Chevallier	Spratt-Archer	Golden Archer	Research	Kenia	Culture 9
1945-46	Brookside	Temuka heavy silt loam	21.5	30.0	29.1	28.9	—	—
1947-48	Brookside	Temuka heavy silt loam	38.0	31.3	38.7	34.4	34.0	33.2
1948-49	Southbridge	Waimakariri sandy loam	58.0	46.7	60.1	63.1	70.0	62.9
1949-50	Southbridge	Waimakariri sandy loam	—	55.2*	51.5	66.5	59.1	64.5
1950-51	Southbridge	Waimakariri sandy loam	—	—	85.4	89.4	84.0	80.1
Average of last 4 trials, 1947-48 to 1950-51			—	—	58.9	63.3	61.8	60.2

* A selection by the National Institute of Agricultural Botany, England.

◆

Book Review

"Walter's Horse Keepers Encyclopedia": W. H. Walter

"WALTER'S Horse Keepers Encyclopedia" is an inexpensive and handy little volume containing a great deal of useful information on all aspects of the subject.

Though it is written for those interested in riding horses in Great Britain, the essentials are well discussed and it can be recommended as a book which horse riders in New Zealand, particularly senior members of pony clubs, could read with appreciation and benefit.

—*A.D.M.G.L.*

Elliot, Surrey. 7s. 6d. in New Zealand.

◆

Analysis of Farming in New Zealand other than Dairy and Sheep Farming

By W. N. PATON, Senior Investigational Officer, Department of Agriculture, Wellington

ALL types of farming in New Zealand other than dairy and sheep farming are covered in this the fifth of a series of articles based on detailed classification of data on agricultural and pastoral holdings obtained in the 1949-50 season's special collection for the 1950 World Census of Agriculture. Holdings have been classified according to the type of farming practised by occupiers and percentages have been calculated for each county based on the number of the total holdings devoted to each farming group represented. The last article in this series is to appear in the January issue of the "Journal".

THE cash crops group comprises holdings where 50 per cent. or more of the total farming effort concerns the production of annual crops for sale, grown on a field basis, as distinct from crops of the horticultural group grown in orchards, gardens, nurseries, etc. It comprises holdings devoted mainly to the growing of cereal and small seeds crops, potatoes, onions, etc.

In only four counties in New Zealand does cash cropping (with or without other sidelines) lead other main types of farming. These counties, with the percentage (in parentheses) of their holdings classified in the cash crops group, are Malvern (40.3), Ellesmere (33.3), Eyre (32.8), and Paparua (25.8). Counties where cash cropping ranks second to other types of farming are Ashburton (27.6), Rangiora (18.2), Waimate (16.1), Selwyn (15.7), Springs (13.5), Awatere (10.5), and Waipara (7.8). Counties where cash cropping ranks third in importance are Kowai (19.3), Ashley (15.0), Marlborough (14.6), Lake (14.2), Amuri (10.3), Cheviot (8.3), and Mackenzie (4.2). The highest rankings for cash cropping in the North Island are fourth placings for Masterton, Waikohu, and Kiwitea Counties, though the North Island county with the highest percentage of its holdings devoted to the cash cropping group is Cook (6.5), but this ranks only sixth in importance with other main types of farming, or uses, in that county.

Upper right—Cash cropping, Southbridge district. Upper left—Horticultural cropping, Heathcote Valley, near Christchurch. Lower—Beef cattle raising, south Westland. Upper and middle photographs by V. C. Browne; lower by National Publicity Studios.

Horticultural Group

The horticultural group is comprised of commercial orchards, gardens, nurseries, etc., as well as apiaries, tobacco growing, etc. It is essentially a "small holdings" group, where specialised and/or intensive agriculture is practised singly or in combination with other types within the group, or with non-horticultural types as sideline enterprises. Many part-time holdings are included in this group. In listing counties where horticultural pursuits rank high in importance the portion in parentheses in each instance gives first the percentage of holdings falling within the horticultural group, second the ranking for order of importance compared with other main farming types or uses, and third the main form of horticulture followed. Details on this basis are:—

Heathcote (43.1, first, vegetables); Waimea (35.8, first, tobacco, orchards, and mixed); Waimairi (35.8, first, vegetables); Eden (29.4, second, vegetables); Hawkes Bay (26.4, second, orchards and vegetables); Vincent (24.8, second, orchards); Mt. Herbert (18.6, second, vegetables and orchards);

Ashley (16.8, second, orchards); Waitemata (15.3, third, orchards); Tuapeka (14.1, second, orchards); Manukau (12.0, third, vegetables); Halswell (11.7, third, vegetables); Tauranga (11.4, second, citrus orchards); Horowhenua (11.3, third, vegetables); Bay of Islands (10.8, second, citrus orchards); Cook (9.6, fourth, mixed); Marlborough (9.1, fifth, mixed); Waimate (8.7, fifth, mixed).

Beef Cattle Group

The following list of counties is worthy of mention for beef cattle raising activities. In parentheses are given first the percentage of holdings and second the ranking for order of importance compared with other main farming types or uses. The details are:—

Grey (14.6, second); Westland (14.0, second); Inangahua (9.9, fourth); Stewart Island (7.1, fifth); Kawhia (6.9, third); Buller (6.7, fourth); Bay of Islands (4.0, eighth); Whangarei (4.0, fifth); Collingwood (4.0, fifth). A continuous strip west of the main divide in the South Island is embraced in the above list. Many of the holdings are operated part-time only.

Poultry Group

Counties with the highest percentages of holdings devoted to poultry farming with or without sideline enterprises are as follows:—

Oxford (10.2, fourth); Waitaki (10.1, fourth); Eden (9.4, fourth); Makara (7.9, fourth); Manukau (6.8, fifth); Waitemata (6.7, fourth); Cook (6.3, seventh); Hutt (6.0, sixth); Taieri (5.7, fifth); Waimairi (5.4, fifth).

With the exception of Oxford, Waitaki, and Cook these counties adjoin the four main centres of population. A fairly high proportion of part-time poultry holdings are included in this group.

Horse-raising Farms

Mostly racehorses are raised on horse-raising farms, and quite a high proportion of the farms are run as part-time enterprises. The portion in parentheses before the percentage gives the number of holdings concerned in horse raising as the main activity. The details are:—

Paparua (78, 11.3, fourth); Halswell (15, 6.3, fifth); Waimairi (49, 4.6, sixth); Heathcote (9, 2.9, seventh); Taieri (23, 2.6, tenth); Levels (20, 2.4, ninth); Manukau (34, 2.3, sixth); Kairanga (12, 1.6, seventh).

Timber Plantations

Counties worthy of being listed for timber plantations have the following details (numbers of plantation holdings are mentioned first):—

Taupo (9, 5.9, fourth); Tawera (4, 4.7, fifth); Waimea (80, 3.6, seventh); Selwyn (7, 2.8, seventh); Rotorua (7, 1.5, seventh); Thames (5, 1.4, seventh).

Mixed Farming Group

In the mixed farming group three or more main types of farming are conducted in combination on the one holding, at least three of which are carried on at the 25 per cent. (or more) level. The following list is given where 5 per cent. or more of the holdings within a county have been classified in the mixed farming group:—

Levels (14.9, second); Ellesmere (11.2, fourth); Cheviot (10.4, second); Ashburton (10.0, third); Oxford (9.5, fifth); Cook (7.4, fifth); Selwyn (6.8, third); Geraldine (6.7, fifth); Marlborough (6.6, sixth); Springs (6.1, fifth); Waitaki (6.1, sixth); Waimate (6.0, sixth); Taieri (5.9, fourth); Tawera (5.8, fourth); Eyre (5.8, fifth); Rangiora (5.7, fifth). Only one North Island county, Cook, is embraced within this list.

"Other Farming" Group

All types of farming other than those already dealt with in this series of articles are comprised within the "other farming" group, except pig farms, *Phormium tenax* holdings, and areas where the cutting of native timber is the main activity. It also excludes what are termed the grazing, residential, and unused holdings groups. In this group are a proportion of holdings too large to be classified suitably as residential, although activities were at no more than the domestic level, and also holdings without residents on them which, although of domestic proportions, could not be properly included in the residential group. Those counties with the highest proportion of holdings falling in this classification group are:—

Stewart Island (14.1, third); Sounds (11.0, third); Inangahua (7.3, sixth); Grey (6.0, sixth); Bay of Islands (4.9, seventh); Taupo (4.6, fifth); Waitemata (4.5, sixth); Mangonui (4.3, fifth); Westland (4.1, seventh).

Grazing Group

The grazing group is comprised of holdings normally let intermittently for grazing, inclusive of those popularly known as dairy "run-offs", or winter grazing areas. Stock dealers' lots, holding paddocks (along stock routes), and show, sports, and school grounds, etc., let to keep down grass growth when not otherwise being used are included also. Those counties with the highest percentages (over 7.5) of their holdings used as mentioned are:—

Hobson (18.4, second); Thames (11.7, second); Lake (11.1, fourth); Mt. Herbert (10.9, third); Kaikoura (10.0, third); Levels (9.9, fifth); Waikouaiti (9.4, third); Hauraki Plains (9.2, second); Akaroa (8.9, third); Maniatoto (8.8, third); Waipukurau (8.6, third); Vincent (8.4, third); Paparua (7.8, fifth); Otamatea (7.7, third); Inangahua (7.7, fifth). The grazing holdings represented are mainly "run-offs" to dairy farms in Hobson, Otamatea, and Hauraki Plains counties, and partly run-offs and ordinary casual grazing areas in Thames County. Those in Waipukurau represent partly holding paddocks and partly casual grazing areas. In all other counties mentioned they all pertain to the South Island and involve casual grazing areas mainly.

Residential Holdings Group

All small holdings where agricultural activities sufficed for little more, if any, than would meet domestic requirements were classified as residential, provided also that they were resided on. It will no doubt be surprising to many readers that the proportion of holdings of an acre or more comprised within county boundaries and covered by the annual agricultural and pastoral statistical collection which can be classified as residential is as high for many counties as the following details indicate:—

Eden (34.1, first); Halswell (23.8, second); Heathcote (23.3, second); Makara (22.2, second); Waimairi (21.0, second); Stewart Island (19.2, second); Chatham Islands (18.9, second); Tawera (18.6, second); Buller (18.5, second); Rangiora (17.6, third); Paparua (17.4, second); Waitemata (17.1, second); Wairoa (17.1, third); Waiapu (15.2, third); Manukau (14.9, second); Waipukurau (14.9, second); Oxford (14.9, third); Bruce (14.6, second); Weber (14.1, second); Malvern (13.9, third); Peninsula (13.8, third); Geraldine (13.6, third); Cook (13.4, third); Waitaki (12.9, third); Waikohu (12.7, third); Ellesmere (12.7, third); Kaitieke (12.6, third). It is surprising, too, to see that numerically the group ranks first in importance in Eden, and second and third in importance in the others listed. Others ranking also second and third have not been given.

Unused Holdings Group

For classification unused holdings were defined as those showing no livestock, no crops, and no residents. A proportion of these holdings is devoted to uses other than of an agricultural nature, but no record was made of them. Details for the counties showing the highest proportion of their holdings in this category are as follows:—

Stewart Island (47.5, first); Inangahua (21.5, second); Taupo (20.4, second); Lake (15.0, second); Collingwood (14.1, third); Westland (13.7, third); Grey (13.0, fourth); Sounds (12.7, second); Great Barrier Island (12.0, third); Peninsula (11.0, fourth).

◆

Book Review

"The Work of the Woolman": Harry Haigh

THE object of this booklet is to help the student apprentice to the wool trade by explaining the jobs he will learn to do and to tell him something of the industry without going too deeply into its intricacies.

As it is written for the apprentice to the British trade, its use is limited in New Zealand, although some of the later chapters will have local interest, especially those explaining the varieties of wool grown in different countries. Mr. Haigh expresses himself in simple language and even when he deals with technical details he is easy to read and understand.

Institutions responsible for training young men for careers in the wool trade should certainly have a copy of this booklet. Those fortunate few from New Zealand who are given the chance of serving their time in the trade in Britain will get much useful information from it.

—*H.R.L.*

E. and F. N. Spon. 10s. 6d.

◆

LEADING FACTORY AVERAGES

Grading Points for Export Butter and Cheese

Contributed by the DAIRY DIVISION

BUTTER-MANUFACTURING companies which obtained an average grade of 93.75 points or more and cheese-manufacturing companies which obtained an average grade of 92.75 points or more during the year ended 31 July 1952, are listed below in order of merit. Of the total listed, 36 butter and 2 cheese factories are in the North Island and 4 butter factories and 1 cheese factory are in the South Island. Production figures are for the balance-sheet year 1951-52, and the figures of quantities graded for export are for the period 1 August 1951 to 31 July 1952.

Creamery Butter

Company	Registered number	Brand	Production tons	Graded for export tons	Average grade points	Grading port
Morrinsville	330	Lockerbie	5,476	5,290	94.337	Auckland
United	1,296	Whariti	571	164	94.335	Wellington
Raetihi	717	Raetihi	326	204	94.306	Castlecliff
Wairoa	1,345	Wairoa	537	102	94.243	Hastings
Collingwood	1,254	Golden Hills	460	264	94.215	Wellington
Taihape	1,188	Tikapu	246	129	94.173	Castlecliff
Cambridge (Hautapu)	1,239	Cambridge	2,759	2,428	94.120	Auckland
Awahuri	664	Red Rose	1,266	576	94.115	Wellington
Cheltenham	3	Pakeha	1,768	857	94.111	Wellington
Rodney	394	Rodney	951	714	94.085	Auckland
Te Aroha-Thames Valley	344	Overseas	4,077	3,636	94.069	Auckland
Wangaehu	1,326	Wangaehu	587	432	94.064	Castlecliff
Okitu	1,270	Okitu	151	62	94.058	Gisborne
Westland	145	Westland	686	46	94.019	Lyttelton
Lepperton	49	Lepperton	138	2	94.000	New Plymouth
Murchison	1,888	Airship	450	13	94.000	Lyttelton
Rangiwahia-Ruahine	750	Quail	163	0.2	94.000	Wellington
Kuku-Manakau	905	Ohau	513	320	93.980	Wellington
N.Z. Dairy (Frankton)	1,510	Anchor	5,702	3,110	93.961	Auckland
Konini	1,203	Konini	1,724	1,084	93.956	Wellington
Masterton	1,307	Masterton	884	639	93.954	Wellington
Tolaga Bay	1,007	Tolaga Bay	219	163	93.939	Gisborne
Rangitikei	1,360	Rangitikei	903	658	93.938	Castlecliff
Golden Bay	146	Sovereign	933	774	93.927	Wellington
Rangitaiki Plains	133	Raingitaiki Plains	6,054	5,489	93.922	Auckland
N.Z. Dairy (Tuakau)	1,320	Anchor	3,781	3,560	93.915	Auckland
N.Z. Dairy (Ngatea)	291	Anchor	2,367	2,267	93.913	Auckland
Kaikohe	40	Kaikohe	751	298	93.907	Auckland
Kia Ora	926	Kia Ora	912	490	93.888	Gisborne
Moa Farmers'	341	Inglewood	2,118	1,669	93.878	New Plymouth
Ruawai	66	Ruawai	2,399	2,366	93.866	Auckland
Rongotea	8	Rongotea	1,240	679	93.837	Wellington
Uruti Valley	300	Uruti	202	202	93.823	New Plymouth
N.Z. Dairy (Waiuku)	111	Anchor	3,275	3,141	93.820	Auckland
N.Z. Dairy (Paerata)	109	Anchor	2,253	1,463	93.788	Auckland
N Z. Dairy (Mt. Eden)	378	Anchor	3,609	776	93.776	Auckland
N.Z. Dairy (Morrinsville)	415	Anchor	3,911	3,883	93.773	Auckland
N.Z. Dairy (Ngongotaha)	724	Anchor	1,729	1,646	93.772	Auckland
Norsewood	600	Norsewood	1,030	885	93.770	Wellington
Northern Wairoa	1,358	Northern Wairoa	4,678	4,529	93.762	Auckland

Cheese

Company	Registered number	Brand	Production tons	Graded for export tons	Average grade points	Grading port
Wright's Bush	206	Wright's Bush	319	322	93.089	Bluff
Dalefield	9	Dalefield	1,175	1,145	92.771	Wellington
Brooklands	1,619	Brooklands	398	391	92.760	New Plymouth

Editor: Professor H. I. Moore

THE JOURNAL OF THE BRITISH GRASSLAND SOCIETY

This Journal is a medium for the publication of the results of research and practical experience in the realm of Grassland Husbandry.

CONTENTS OF VOLUME VII, No. 2, 1952

1. Farming in Berkshire .. .. .. J. Pearce
2. The Relative Palatability of Herbage Plants .. .. J. D. Ivins
3. The Grasslands of Raita, Bombay .. F. R. Bharucha and R. N. Dave
4. Further Seed Studies in Sainfoin .. J. R. Thomson

This Journal is published quarterly. Subscription, Vol. I, 15/-; Annual Subscription thereafter, 30/- per volume. Orders to:—
The Secretary, British Grassland Society, 69 May Street, Belfast, Northern Ireland.

Soil-testing Services to be Expanded

DURING recent years the Extension Division of the Department of Agriculture has developed an advisory soil-testing service to help farmers and the division's instructors to diagnose soil-fertility problems, and about 8000 samples are now tested annually. The service has not been able to meet the demand for tests, and Cabinet recently approved its expansion on the basis of full recovery of costs. As the demand increases additional staff will be appointed and the service will be expanded to deal ultimately with 20,000 samples a year.

Charges for Soil Testing

As from 1 January 1953 the charges for soil testing will be £1 per sample, or where more than four samples are required a basic charge of £4 will be made for a farm visit and the analysis of four samples and 10s. will be charged for each additional sample. Farmers should lodge applications for soil testing with their local Instructors in Agriculture. Testing fees are required to be paid within 14 days of the collection of samples.

Farm Group Testing

Over the past few years the Waikato branch of Federated Farmers and the Extension Division have co-operated in trials of farm group soil testing and these trials have been very useful, because the results of the soil tests and advice on soil treatment have been the subject of group discussion. Instructors have been able to summarise soil-testing and experimental data by soil types and advise both particularly and generally on suitable fertiliser and lime treatment for particular fields and for soil types generally. Facilities for expanding the farm group soil-testing service are envisaged in the plans for an enlarged soil-testing service, and it is expected that work of this nature will be begun in the Waikato and Canterbury and gradually expanded to other districts as the demand arises.

Interpretation of Results

The results of the soil tests are sent to the farmer by the local Instructor in Agriculture together with his advice on interpretation and suggested fertiliser and lime treatment. His advice is guided both by the soil tests and by his knowledge of local soil types and experimental work which has been carried out on each soil type. Collection of samples is the duty of instructors, for they must be collected by soil type and the results of the tests might be valueless if carelessly collected samples represented a composite of soil types. If the tests are carried out properly, the results are a very valuable guide to fertiliser and lime treatment.

Disease in the Household Poultry Flock

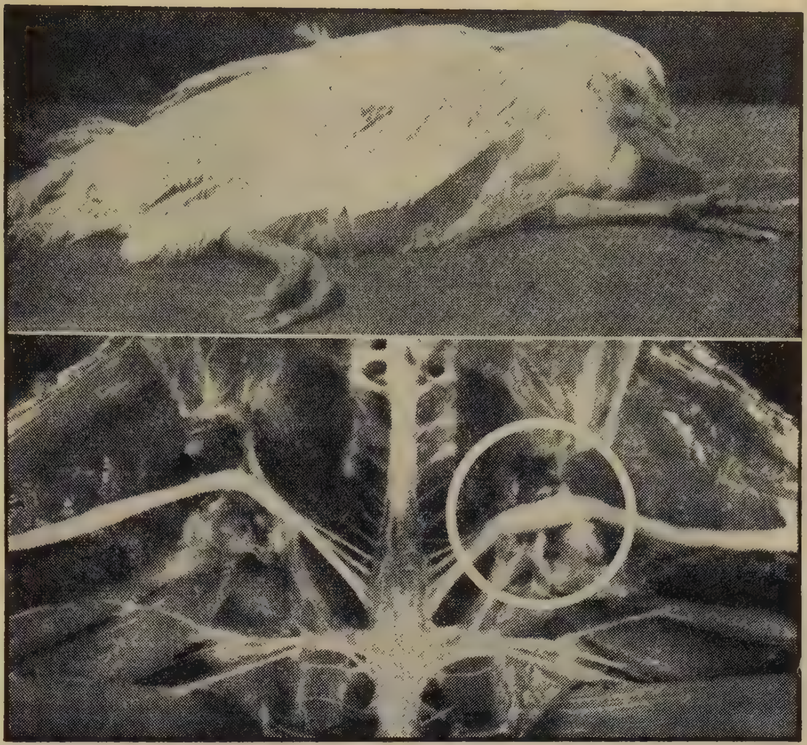
Contributed by the Animal Industry Division

DISEASE in the small household flock may be a source of worry to the owner. Although answers to requests for information received by the Department of Agriculture often offer no hope of saving individual birds, many owners are anxious to learn whether the diseases concerned are likely to affect other birds in their flocks. There is also a natural curiosity regarding the factors which have given rise to the condition and a desire for an explanation of its cause and control.

MOST articles written on poultry disease are intended for commercial flock owners, whose problems are on a different scale from those of the household poultry keeper; and in any case the latter is seldom interested in disease until it occurs in his own flock. Further, the commercial man is not interested in saving individual birds which may be a source of infection to others in the flock.

A brief explanation of the various disease conditions commonly found in household flocks is given below. The conditions may be classified arbitrarily into:—

Those in which treatment is of no value or is uneconomic; and
Those which may be treated or controlled by management.



Fowl paralysis. Upper—An affected bird showing advanced symptoms of paralysis unable to stand. Lower—The muscles and kidneys have been dissected to show the diseased sciatic nerve. The enlarged area (ringed) of the right sciatic nerve is compared with a normal nerve on the left side.

In cases of the first type advice is usually given to dispose of the bird as early as possible, either because it is useless to attempt treatment or because it is known that the bird or birds will not return to production within a reasonable time. The treatment of such cases is therefore uneconomic, and frequently they can be killed and used as table birds.

The second type of disease will include minor ailments or those arising from management or feeding faults which may be corrected.

Unavoidable losses occur from diseases for which there is no treatment, such as fowl paralysis, but many of the diseases which lead to loss or poor production are preventable. They usually arise from neglect of good management, hygiene, and sanitation or from poor type of feed. If the advice given in previous articles in this series on management and nutrition is followed, the disease risk will be much reduced.

Fowl Paralysis

Fowl paralysis or leucosis is the most common cause of loss, not only in household flocks but throughout the poultry industries of almost every country. Although the term paralysis is commonly used, this aspect of the disease is now accepted as only one manifestation of the avian leucosis complex.

Leucosis may affect the bird in a number of ways, and it is now recognised that, although the symptoms do not show up until 3 to 9 months of age, the infection is contracted during the first few weeks of life.

The principal forms of the disease are:—

True fowl paralysis, in which the nerves are affected and the symptoms shown depend on the site of nerve injury, for example, lameness in one leg with the toes turned inward in a clutching position, drooping of the wing, twisting of the head and neck, gasping, or even paralysis of the nerves supplying the crop, resulting in crop binding.

The visceral form, sometimes called big liver disease, may give rise to various symptoms depending on which organs are affected. Egg production drops or ceases and loss of condition is fairly rapid. The comb and wattles become pale, and diarrhoea may be evident. Post-mortem examination may show the liver, kidneys, ovaries, or intestines to be affected. Tumours are also common in the viscera.

The bone form gives rise to enlarged and thickened leg bones.

The eye form, or "pearly eye", causes distortion of the pupil, which becomes irregular instead of round, and it may lead to blindness.

Reminders for January

New season pullets are coming into lay. Quite often these birds lay double-yolked eggs. This fact need not cause concern, because usually after a few weeks of laying normal eggs are produced.

Some laying birds may go into a moult this month. These are early moulters and usually are low producers. Such birds should be sold off or eaten and not kept for a second laying season.

Hot weather is usual at this time of the year. Birds, whether young or old, appreciate shade and cool, fresh water. Water troughs should not be left in the blazing sun.

A watch should be kept for external parasites. Lice and mites multiply rapidly in warm weather and in large numbers drain the constitution of birds.

Hot weather can mean a deterioration in egg quality. Eggs should not be left in a hot room; they should be collected frequently during hot weather and stored in a cool place.

The quality of green food deteriorates during dry spells of weather. Tough and fibrous green food from old plants is of little feeding value to poultry.

Uniform to the last drop . . .

Because it's the ONLY LIQUID PHENOTHIAZINE that's "double-processed" to exclusive Premier Products formula.

The exclusive double-process formula by which Phenzeen Plus is made ensures thorough, even dispersion of the worm-killing drug. So Phenzeen Plus pours freely to the last drop and under no condition does it settle hard. It's ready-mixed and perfectly mixed. Each and every dose contains the correct amount of phenothiazine. Phenzeen Plus was the first liquid phenothiazine on the New Zealand market and years of experience are behind its production. Season after season, it has been proved in the hands of thousands of practical farmers.

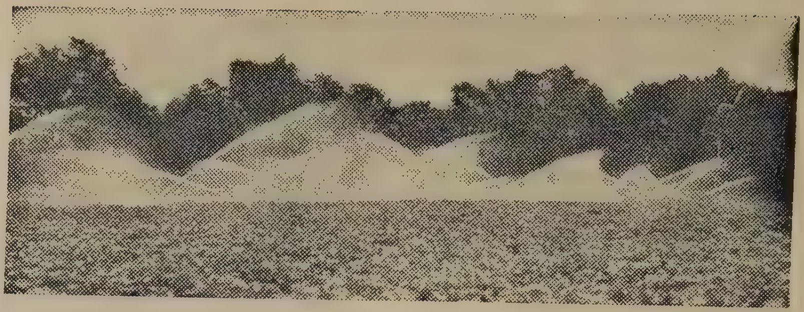
Ask For—And See That You Get

Elliotts

PHENZEEN PLUS

You can be assured of supplies for next season by booking your order NOW through your stock firm. Manufactured and distributed throughout New Zealand by

PREMIER PRODUCTS LTD.,
WELLINGTON.



IRRIGATION PAYS! *But It Pays Better With A* BISLEY IRRIGATION SYSTEM

HAVE RAIN WHEN AND WHERE YOU WANT IT THROUGHOUT THE DRY SUMMER MONTHS!

Bisley's simple, practical equipment, incorporating the latest overseas developments, takes the hard work out of irrigating.

LOWER LABOUR AND OPERATING COSTS.
LOWER CAPITAL COST. HIGHER EFFICIENCY.

For details of the best value in irrigation equipment send us your name and address. There is no charge for our helpful literature and planning service.

Mr. ....

Address ....

....

A. M. BISLEY & COMPANY LIMITED,
P.O. BOX 487, HAMILTON — Branches and Agents throughout N.Z.

"NO EQUAL FOR HILL WORK"

says DAVID BROWN CRAWLER owner.

". . . low centre of gravity allows negotiation of most amazing country . . . inspires confidence . . . fuel cost very low . . . received back total purchase price in returns by contracting in 8 months."

—D. G. Monrad.

SERVICE and SPARE PARTS available everywhere

Crawlers from
£1,279
complete, f.o.r. main ports.
Wheel models from
£679
Delivered any dealer town.

DAVID BROWN
N.Z. Distributors:
TODD BROS. LTD., Wellington.
Dealers everywhere.

Diagnosis: Where the typical symptoms of paralysis of the leg or wing are present, particularly at 3 to 6 months of age, the condition is usually easy to recognise, but in some of the other forms, such as the visceral form, it may be possible to distinguish it from other diseases only on autopsy.

Treatment: There is no treatment of any value for this condition. If the affected bird is in good condition and is killed at an early stage, it may be dressed for table use.

Coccidiosis

Coccidiosis is a parasitic disease which arises from invasion of the lining of the intestine by microscopic parasites called coccidia. There are many different species and each is "host specific"; that is, it will survive only in one species of bird or mammal. This point is important, since wild birds have been blamed for starting outbreaks of coccidiosis in poultry flocks in the past, but it is now known that the species infesting wild birds do not affect fowls. Coccidia are passed out in the droppings of affected birds and can be picked up by other birds.

Two main forms exist: Caecal coccidiosis, which affects young birds from 10 days to 6 weeks of age, and duodenal coccidiosis, usually found in older birds.

Caecal Coccidiosis

The affected chicks show a dejected appearance, feathers ruffled and drooping, pale heads, and possibly leg weakness. An important symptom is blood in the droppings. Losses may be heavy unless treatment is applied promptly.

On opening up affected birds the "blind gut" or caecum may be found to be full of blood in the very acute stage or filled with a mixture of blood and a yellow cheesy material. At the laboratory confirmation is carried out by examination of scrapings from the caecum under the microscope.

Control: Although coccidiosis arises primarily from infestation with the parasite, it has been found that, provided the chicks acquire the parasites gradually, resistance to any ill affects is stimulated in a similar fashion to the use of a vaccine against other diseases. It is important that the number of parasites picked up should not be excessive or the chicks' resistance will be broken down and an outbreak of coccidiosis will follow. Factors which favour a high and therefore dangerous concentration of coccidia in the litter are overcrowding and poor, damp litter caused by insufficient ventilation or the spilling of water from drinking vessels; chilling and inadequate diet may also be responsible in some cases.

Treatment: Sulphaquinoxaline and sulphamethazine are both specific for the treatment of caecal coccidiosis, and provided they are used at an early stage in the doses recommended by the manufacturers, will give excellent results. Attention should also be given toward correcting errors of management.

Duodenal Coccidiosis

Duodenal coccidiosis is found in older birds of 3 to 6 months of age and is usually chronic. It may cause few deaths, but give rise to a chronic wasting illness and loss of egg production. The comb and wattles are pale and shrunken and the bird has an unthrifty appearance.

Control: This chronic form is more difficult to clear up than the caecal type. The factors which give rise to it are similar — damp litter, overcrowding, and poor feeding. A heavy infestation with roundworms and lack of vitamin A in the diet are commonly associated with outbreaks of duodenal coccidiosis.

A pullet suffering from duodenal coccidiosis and unable to stand upright because of general debility.

Treatment: Sulphaquinoxaline is of value in the early stages of the condition, but if the birds have been allowed to go too long before the drug is used, they may not be worth treating, since it normally requires some time to bring them back to egg production again.

The secondary factors of management, feeding, and the worm burden of the birds must also receive attention.

The Large Roundworm

The large roundworm is normally present in small numbers in most birds without causing any untoward results. When present in large numbers, however, it may do considerable harm and cause wasting, loss of condition, and affect egg production.

The adult worms in the intestines lay large numbers of eggs, which pass out in the droppings. These eggs are very resistant and can persist in the ground for a long time, particularly under damp conditions or in shaded areas of the run. The White Leghorn is probably more susceptible to the effects of the large roundworm than the heavier breeds. Age also plays a part and as the birds become older they are more resistant to roundworms; deworming is seldom required by birds over a year old. It must be emphasised, however, that although the older birds are not affected, they may be a source of danger to the younger birds by grossly contaminating the run.

Control: Chicks or perching pullets must be reared on fresh ground which has not been used by adult stock for at least 6 months. The roundworm eggs are destroyed by the drying action of the sun, and provided the grass is kept short over the summer, the ground will become safe to use for young birds. In small runs removal of the topsoil may make them safe to use.

Treatment: Carbon tetrachloride is the drug which has shown the best results in deworming. It may be obtained in small gelatine capsules which are easily administered, and as a routine measure of protection it is advised that pullets should be given a 1-c.c. capsule at the age of 3 months. If necessary it may again be dosed at 5 months of age with 2 c.c. of carbon tetrachloride. The birds should be starved for 18 to 24 hours before dosing to ensure efficient deworming. A feed may then be given immediately after dosing is completed.

Avian Tuberculosis

Avian tuberculosis is frequently referred to by poultry keepers as "going light" because of the loss of condition and weight and the pale colour of the comb and wattles. It occurs mainly in second- or third-season birds and is seldom evident in younger birds. The loss of weight eventually leads to emaciation and may be accompanied by other symptoms such as diarrhoea, lameness, and general weakness. Despite these symptoms the birds frequently maintain a good appetite.

Post-mortem examination usually reveals small yellow nodules in the spleen and liver. Other organs and the intestines may also be affected.

Control: It is advisable to kill off all visibly affected birds and submit the remainder to the tuberculin test. The birds which survive the test should be transferred to clean ground. If, however, the percentage of reactors to the test is high, it is probably inadvisable to retain those which are left.

The ground on which the birds have been running should be rested for at least a year. Digging or ploughing up followed by heavy liming assists the cleaning up process. Special attention must be paid to the areas around the drinking troughs or parts in the shade or shelter of the house where the birds normally congregate.

It is usually advisable to consider retaining birds for one season only if trouble has been experienced with tuberculosis in the past.

The four diseases briefly described are probably the most common specific conditions affecting the household poultry flock. In the January issue of the "Journal" another article will deal with other possible sources of loss in the small flock.

Maintain condition

and you maintain

Profit . . .

with this low-cost drenching programme

For all general flock drenching there is no more economical means than **Sutton's Nicotine Bluestone** — recommended and proved. Sutton's eradicates tape worms and black scour worms at a cost of only a fraction of a penny per dose. Easy to administer. Ask your stock firm for

Sutton's

NICOTINE BLUESTONE

If you're in a liver fluke area, then you need **Giesen's Carbon Tetrachloride Drench.** Dosing with carbon tetrachloride is the standard treatment of liver fluke, giving practically 100% results against all adult liver fluke present in the intestines. Also effective against large Stomach worms. Highly economical. A firm favourite for many years. Ask your stock firm for

Giesen's

CARBON TETRACHLORIDE

STOCKISTS EVERYWHERE.

N.Z. Manufacturers and Distributors of Sutton's Drench, Giesen's Drench and Double Processed Phenzeen Plus Liquid Phenothiazine Drench.

PREMIER PRODUCTS LTD.,
WELLINGTON.

But I've switched off....

Maybe you have, but

ACID ACTION

doesn't stop then

Research has proved that ACID ACTION is just as much a menace to an engine when it's idle as when it's toiling under heavy duty conditions. Even built-for-tough-work farm tractors do not escape. **Shell X-100 Motor Oil** contains additives which neutralise corrosive acids and make the oil spread evenly and firmly, clinging to engine parts under *all* conditions.

SHELL X-100 MOTOR OIL

ODOURLESS . . . ALKALINE

fights ACID ACTION

MAJOR CAUSE
OF ENGINE WEAR

The Shell Company of New Zealand Limited (Incorporated in England) X3.2D

GREAT VALUE

• in TARPAULINS

—IDEAL FOR EVERY PURPOSE

Standard sizes. In green, proofed jute material. Leather reinforced, all ready roped. Ideal for tough and rough usage—and where corners and ends protrude.
10ft. x 9ft., £5/7/6; 12ft. x 9ft., £6/9/-; 12ft. x 10ft., £7/1/-; 12ft. x 15ft., £10/15/-; 18ft. x 15ft., £16/2/6; 18ft. x 18ft, £19/7/-; 21ft. x 15ft., £18/16/3.

• DRILL AND TRACTOR COVERS

In the same great-service, proofed, green jute material. Also most excellent for protruding corners, etc. and long and hard service.
9ft. x 6ft., £3/3/-; 12ft. x 6ft., £6/6/-. Special sizes made to order.

MATERIAL SAMPLE WILLINGLY SENT ON REQUEST.
FREIGHT PAID TO ANY SOUTH ISLAND RAILWAY STATION.

• POST THIS HANDY COUPON!

SMITHS CITY MARKET LIMITED

"THE SOURCE OF FARMERS' SATISFACTION."

550 COLOMBO STREET - - - - - - - - - - CHRISTCHURCH.

SMITHS CITY MARKET LTD., 550 Colombo Street, Christchurch, C.1.
Please post me tarpaulin/cover material sample or
* Rail to .... Station the following
....
....
(Strike out which does not apply.)
Fill in * part to your requirements when ordering.
NAME ....
ADDRESS ....
....
I enclose remittance (cheque, money order) for £..........................

Honey House Construction

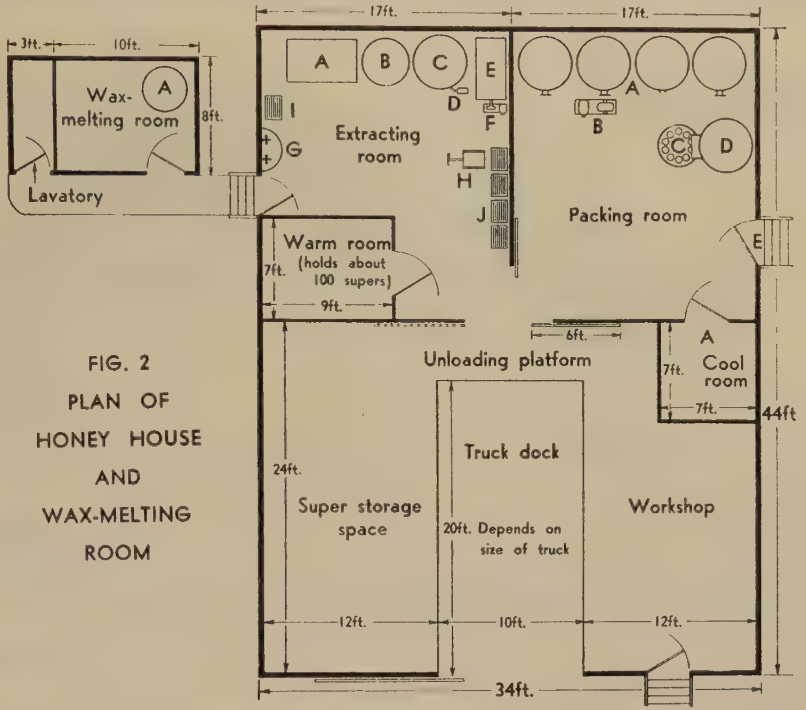
HONEY production in New Zealand has now reached the stage where most beekeepers have very definite ideas as to the equipment required to handle the honey crop successfully. In this article C. R. Paterson, Apiculturist, Department of Agriculture, Hamilton, discusses the general layout of what could be termed a modern honey house incorporating all the essentials for the present and future beekeepers of this country and conforming to the Food Hygiene Regulations 1952.

THE Food Hygiene Regulations 1952, administered by the Health Department, state that certain conditions must be observed where any food is being manufactured or packed. Important items covered in these Regulations will be dealt with as they apply to the various parts of the honey house.

A honey house to be of any great use to a beekeeper should be large enough to meet all his requirements. In the past many beekeepers have begun in a comparatively small way and from time to time have increased their hive holdings. This has generally necessitated additions to the honey house, with the consequence that the general layout has never been what the beekeeper could call an ideal set-up for convenience of work.

Size of House

It is perhaps rather hard to say just what size a honey house should be, because each beekeeper has his own ideas. This article concentrates on the description of a honey house that will meet the requirements of a beekeeper with up to 700 or 800 colonies of bees.



17ft.
17ft.
3ft.
10ft.
8ft.
Wax-melting room
A
Lavatory
A
B
C
D
E
F
G
H
I
J
Extracting room
A
B
C
D
E
Packing room
Warm room (holds about 100 supers)
7ft.
9ft.
6ft.
Unloading platform
A
Cool room
7ft.
7ft.
44ft
24ft.
Super storage space
Truck dock
20ft. Depends on size of truck
Workshop
12ft.
10ft.
12ft.
34ft.

FIG. 2

PLAN OF HONEY HOUSE AND WAX-MELTING ROOM

Key to plan. Wax-melting room: A—Steam boiler. Extracting room: A—Uncapping unit. B—Comb holder. C—Extractor. D—Pump. E—Heating and straining unit. F—Automatic pump unit. G—Wash basin with hot- and cold-water taps. H—Truck bogey. I—Full combs. J—Extracted combs. Packing room: A—Tank. B—Unit for pumping honey to stirring tank. C—Filling machine. D—Stirring tank. E—Desirable doorway if honey is to be sold direct to public. Cool room: A—1/3 h.p. cooling unit. Below—Front elevation of honey house and wax-melting shed.

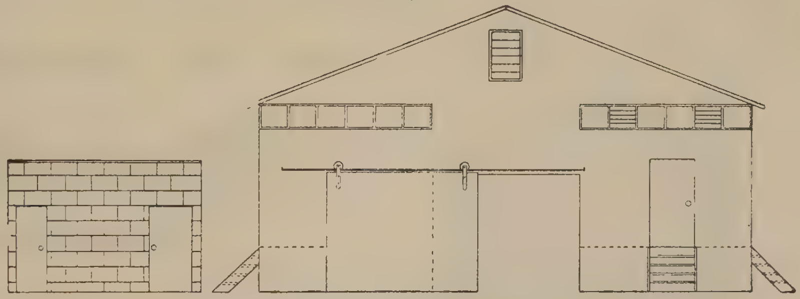
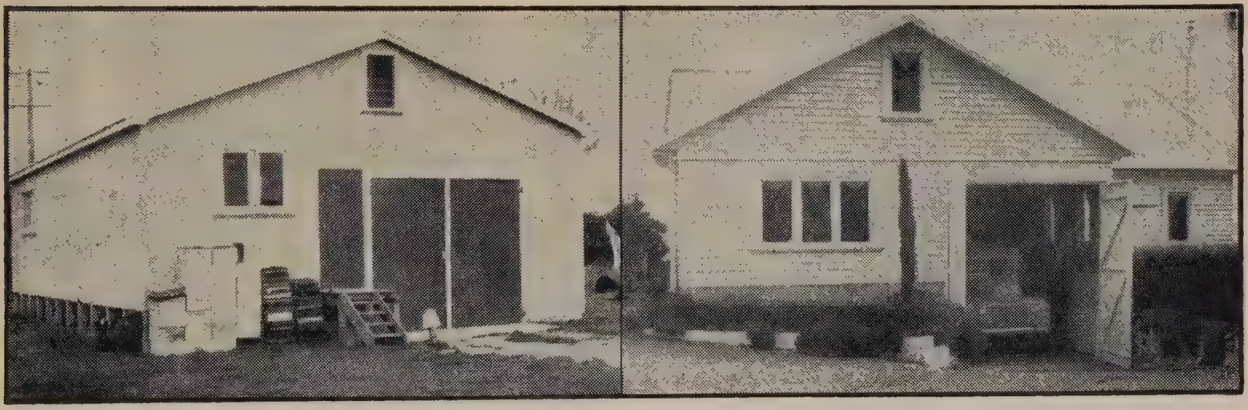
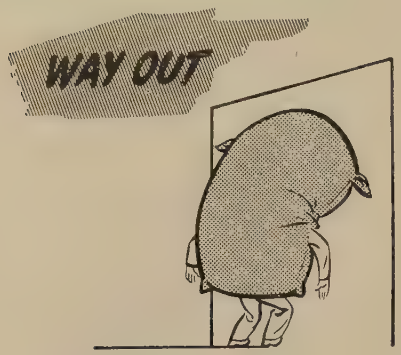


Fig. 1 (below)—Two types of honey houses. Left—A house on piles, with the truck dock at ground level. Right—A house built on sloping ground, with a sunken truck dock. Drainage is into a nearby farm drain.





Increased Farm Production, and increased profits, depend upon how much extra work can be done by the same number of hands. Old-fashioned methods must give way to new—cumbersome ways must be streamlined.

Bates Multiwall Paper Bags speed up Top-dressing and cut down the labour. 20 bags to the ton, **Bates Multiwall Paper Bags** are easier to carry. They open quickly, empty cleanly and avoid the waste of super sticking to the bag.

In addition, there's no loss through leakage and the contents are free from lumps.

It will pay you to look out for **Bates Multiwall Paper Bags** and look into their advantages.

F&P
MANUFACTURED BY
N.Z. FOREST PRODUCTS LTD.
AUCKLAND
TO
BATES ST. REGIS
SPECIFICATIONS
REGD

BATES MULTIWALL

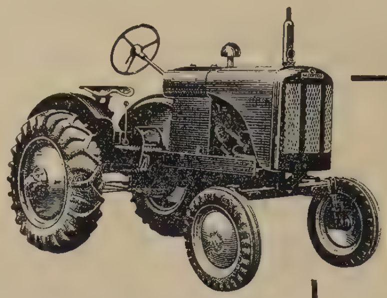
PAPER BAGS

Manufactured to Bates-St. Regis specifications.

Further particulars from the manufacturers:

N.Z. FOREST PRODUCTS LTD.,
(Multiwall Bag Division),
PENROSE - - - - AUCKLAND.

52.6F



MR. FARMER

The Famous BRITISH

PRESIDENT

TRACTOR OFFERS YOU

LOW *Initial Cost!*
LOW *Running Cost!*
BUT
HIGH *Return for your Investment!*

The famous **PRESIDENT tractor** is "poised for power", giving the absolute maximum performance at minimum cost!

With no waste of power, the **PRESIDENT** ensures the utmost in economy of operation, with performance out of all proportion to its size.

AGENTS:

Whangarei: Paine Bros. (North Auck.) Ltd. **Auckland:** Broadway Motors Ltd. **Waiuku:** Hutchinson & Knight. **Tuakau:** Tuakau Service Motors Ltd. **Hamilton, Cambridge, Waitoa, Waharoa:** G. E. Clark & Sons Ltd. **Tauranga:** Kane and Kane Ltd. **Matamata:** Matamata Machinery Exchange Ltd. **Te Aroha:** Tractor Services (Te Aroha) Ltd. **New Plymouth, Stratford, Hawera:** Newton King Ltd. **Kihikihi:** Kippenberger & Martin. **Thames:** W. Judd Ltd. **Tokoroa:** Cameron & Kirkman. **Tirau:** Patatere Service Station. **Rotorua:** G. E. Giltrap Ltd. **Napier:** Citroen Motors Ltd. **Wanganui:** Farm Products Co-operative (Wanganui) Ltd. **Palmerston North:** Manawatu Machinery Exchange Co. Ltd. **Nelson:** Farm Services (Motueka) Ltd. **Invercargill:** Hart Motors Ltd. **Dunedin:** Reilly's Central Parking Station Ltd. **Te Puke:** Te Puke Motors Ltd. **Lincoln:** W. A. Habgood Ltd. **Te Teko:** Te Teko Motors.

For the modern farmer

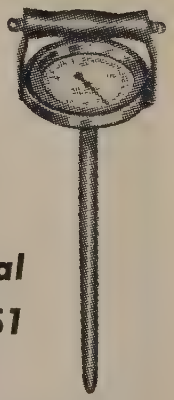
Rototherm

SILAGE, STACK AND
GRAIN THERMOMETER

Awarded Bronze Medal
London Dairy Show, 1951

distributors:

A. & T. BURT LTD. AUCKLAND
WANGANUI CHRISTCHURCH
WELLINGTON DUNEDIN
TIMARU INVERCARGILL



Usually a building of approximately 1000 sq. ft. of floor space is required to handle the crop from about 500 colonies, or approximately 200 sq. ft. for every 100 colonies. Fig. 2 shows a honey house with a floor space of close on 1600 sq. ft. There is no reason why these measurements could not be reduced should the building be considered too large.

Position of Truck Dock

A motor truck is an essential for the large honey producer. As it represents a considerable capital outlay, care should be taken to see that it is properly housed. The most convenient place for garaging appears to be in a part of the honey house building. It is then right on the spot where all the loading and unloading is done, is closed off from robbing bees, and enables the beekeeper to handle a load of honey in at least some comfort. The incorporation of the truck dock or garage in the main building creates certain difficulties in the construction of the honey house. To make use of the various hand trucks or bogeys used in unloading it is essential to have the floor level of the honey house somewhere near that of the tray of the truck. This is usually done by building the honey house on piles which will give the required height. Such a house can be seen in Fig. 1, left.

Another method is to excavate the truck dock below ground level. This method can be used successfully only where the building is being erected on a slight slope and where no difficulty would be experienced in having natural drainage from the dock floor. Fig. 1, right, shows a building on level ground with a lower truck dock. This construction was possible because a large farm drain was close to the building and is connected to the honey house by another drain. If the building site is sloping, the possibility of using the second method should be considered; otherwise it is most likely the first one will have to be used.

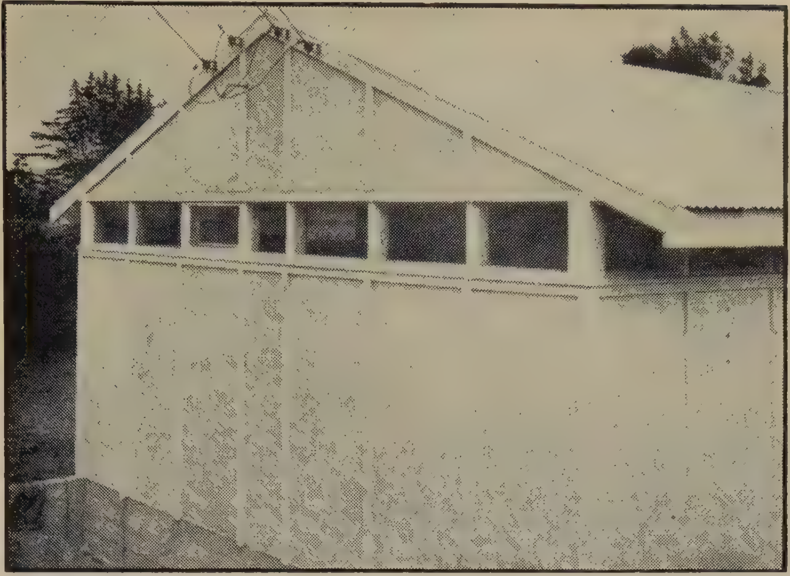


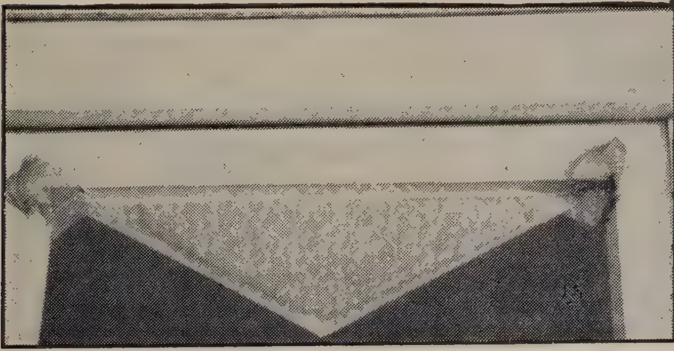
Fig. 4—Windows set high in the walls of the honey house. Such windows can be placed right round the house, giving light from all directions.

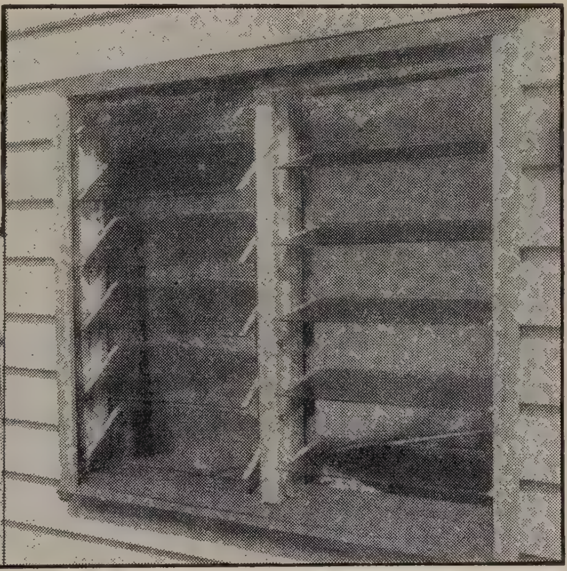
Motor trucks run over all sorts of roads and the beekeeper's truck travels over much farmland, and it is necessary to have the dock floor concreted or treated with some other material so that this portion of the building can be swept and kept clean.

Location of Compartments

Proper location of the various compartments is important for general efficiency. Erection of any honey house at present is costly, so care should be taken to arrange the various compartments with a view to saving labour as much as possible. Honey should be brought in by the truck and move in an orderly route through the honey house until it is packed and ready for market. With the truck garage in the honey house building it is possible to have access all round the truck and to every part of the building. In the honey house shown in the plan supers can be loaded from the space on the left of the dock or apiary equipment can easily be picked up from the workshop on the right. Through the sliding door ready access can be had to either the extracting or packing rooms.

Fig. 3—Types of windows. Below—Method of providing bee escapes in windows. The top corners of the glass have been cut off and cone-shaped wire bee escapes have been fitted over the openings. The triangular board helps to guide bees to the openings. Right—Screened louvre windows give maximum ventilation and prevent bees from entering the honey house. Though not visible in this illustration, a fine-mesh screen has been fixed over the outside of the window.





It is necessary that these rooms be walled off from the workshop and truck dock.

Beekeepers who wish to use steam can arrange for the boiler to be placed outside in a separate building, preferably made of concrete blocks. This also overcomes the annoying vibration caused by modern oil-feed boilers.

A wash-basin with hot and cold water taps should be conveniently placed and is essential in all honey houses under the new Food Hygiene Regulations. Care should be taken that drainage is satisfactory and conforms to local authority regulations.

Efficient Use of Space

Effective use of all available space is important. Considerable space is taken up in a honey house building with the storage of empty honey containers and other equipment. In the type of building described here space can be made available in a loft above the truck dock. Access to the loft can be from either the workshop or the unloading platform (see Fig. 2). The loft space is reduced considerably if access is made from the truck deck. It is not desirable to extend the loft over the super storage room, as this may reduce the capacity of this compartment. A certain amount of space will, of course, be available over the ceilings of the extracting and packing rooms, and could be used to advantage.

Compartments should be used solely for the purpose designed. The extracting and packing rooms in any honey house should be just large enough for the efficient handling of the crop. Because these rooms, including the ceiling, now have to be lined with some type of wallboard, it is too expensive to have them larger than required. There is also a tendency to make use of these rooms for other purposes if they have spare floor space. With the enamel paints available today these compartments can be painted and easily kept clean.

General Construction

Details of important general construction features are as follows:—

Lighting

Adequate lighting is essential for efficient working conditions. It is very difficult to fill retail containers with honey if all the light is at the back of the tank. Similarly in the extracting room light is required when the operator is in many positions. The ordinary casement-type window is not very suitable for a honey house. They perhaps make the building look very nice from the outside, but are very inefficient for lighting. A few supers stacked up against a window of this type darken the room considerably. Fig. 4 shows how a row of windows can be placed right round the building at a height which makes it unlikely that they will ever be covered over. With windows of this type it is possible to have light coming in from all directions. The installation of this system in a new building is not complicated and will probably be cheaper than casement windows.

Ventilation

In addition to adequate lighting proper and sufficient ventilation is necessary. Casement windows are also unsuitable for this purpose because of the difficulty of fitting screens over the openings. The movable-type louvre window appears to fill the beekeeper's requirement best of all. A number of these can be located in appropriate places in the window system. They can be screened on the outside as shown in Fig 3, right.

This type of window and ventilator is easy to operate and gives maximum ventilation.

Bee Escape Passages

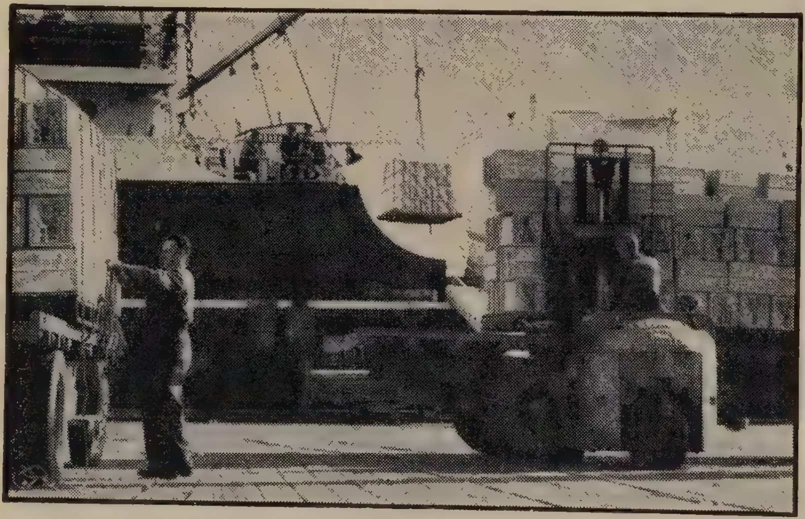
To rid the building of any bees that may be brought in with the honey supers small triangles can be taken off the top corners of each pane of glass. A wire gauze escape cone can be fitted on the outside over each of these small openings. It is also possible to guide the bees to these openings by a V-shaped board as shown in Fig. 3, left.

Floor Material

With a building on ground level and a lower truck dock it will be possible to use concrete as a floor material. Should the raised floor be necessary, a wooden floor will have to be used. The Hygiene Regulations require that the floor be sound and capable of being kept clean and hygienic. Ill-fitting wooden floors or concrete with rather a rough surface can be made usable by the use of sheets of hardboard. These are soaked in water before being laid down; they appear to lie flat. They can then be painted with a good, hard-wearing floor paint.

If all the details mentioned in this article are attended to, irrespective of whether the honey house is old or new, the beekeeper will have a building that is a pleasure to work in and will meet the requirements of the Food Hygiene Regulations 1952.

New Method of Handling Export Fruit



BECAUSE of the necessity for quick turn-round of ships, and especially in view of the need for placing as much fruit as possible on the English market because of the high prices offering, it is essential that shipments of fruit be loaded quickly and efficiently. Last season the fork-lift truck and pallet method of loading was used by the Nelson Harbour Board, and the experiment was most successful, resulting in a considerable saving of time and almost eliminating the smashing of cases.

The Nelson district produces approximately 1,500,000 cases of apples and pears annually, and of these about 1,350,000 are shipped out of the province. Previously each case had to be handled six times from the grower's shed to the hold, but now the cases can be loaded on to the pallets at the grower's shed and remain on the pallets until they reach the ship's hold.

Radio Broadcasts

RADIO broadcasts to farmers will be given from 2ZA Palmerston North at 12.30 p.m. as follows:—

5 January—"Sheep Dipping", by E. Nelson, Livestock Instructor, Department of Agriculture, Palmerston North.

12 January—"The Dairy Farm Improvement Scheme", by R. T. du Faur, Investigating Officer, Department of Agriculture, Palmerston North.

19 January—"Preparing for Your Winter Vegetable Supply", by B. P. Coleman, Horticultural Instructor, Department of Agriculture, Palmerston North.

26 January—Y.F.C. session, by I. G. Tabor.

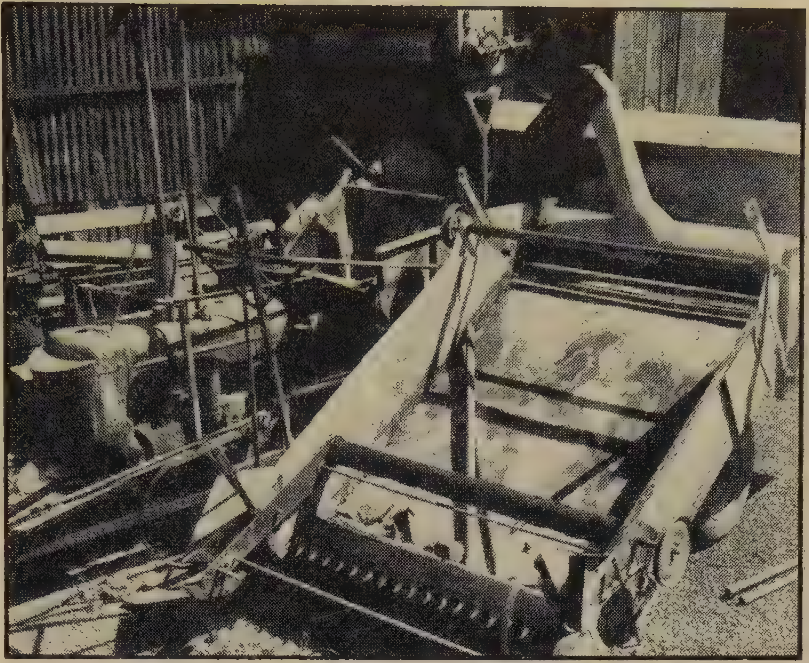
Preventing Fires in Harvesting Machinery

By C. J. CROSBIE, Machinery Instructor,
Department of Agriculture, Christchurch

EVERY summer brings its number of fires in the country, perhaps the most spectacular being the scrub and forest fires which lay to waste thousands of acres of young forests each year. But another serious site of fires is in the machinery engaged in harvesting crops, which culminate a year's toil and effort. Though costing thousands of pounds annually, the loss of machinery in these fires is perhaps not as serious as the value of the crops lost, because there is temporarily no means of harvesting them. Many crops have shaken the ear or rotted on the ground before other machinery could be obtained to harvest them.

DURING each harvest there is a toll of header harvesters that have caught fire and have been rendered useless, temporarily at least, though one or two are so seriously damaged that they are not able to be used until the next harvest. Fires in header harvesters invariably start because flag and other harvest residues are allowed to collect around the manifold of the motor, where they build up in intensity and sooner or later catch fire. This is so in header harvesters that are engine functioned and also in self-propelled machines where the motor is situated low down under the body.

In one make a line of self-propelled header harvesters had to have an auxiliary fan mounted on the side of the motor to blow air past the manifold to prevent rubbish building up on it and starting a fire. The danger of starting a fire by refuelling a motor when it is running or even when it is very hot is ever present and this is especially true of some engine-functioned units where the petrol tank is situated over the motor so that overflows splash on to the hot engine. Electrical sparks in the presence of petrol fumes have also caused fires.



[Green and Hahn Photography Ltd. photo.

Through an accumulation of rubbish around the manifold this header harvester caught fire in the field and was so badly burnt that it was out of action until the following season. Repairs cost more than £500.

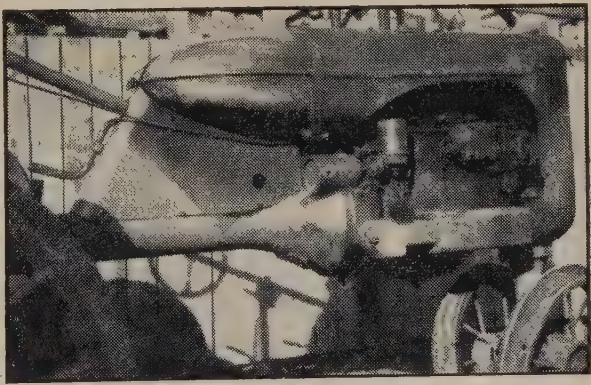
Precautions Against Outbreaks of Fires

Undoubtedly the best way of combating fires in harvesting machinery is to prevent a situation occurring that is likely to lead to a fire. To this end all operators are urged to:—

1. Prevent build-up of combustible harvest residues around the motor and especially in the region of the manifolds.
2. Keep the motor and machine clean of oil and grease smears that attract and collect small particles of vegetative matter.
3. Fit spark arresters to the exhaust pipes of tractors and header harvester engines that are likely to backfire.
4. Take care in refuelling. Never refuel with the motor running. It should be cool before this operation is carried out.
5. Be careful with matches and smoking in the harvest field.
6. **Fit a fire extinguisher to each harvest machine.**

Engine-powered hay balers also catch fire in the field and again the primary cause is the building up of light, air-borne wisps of dry leafage around the manifold and cooling fins of their motors, which are generally air cooled. Though these motors are shrouded, material can still penetrate under the shields and build up to form a mass that is easily ignited.

Farm tractors have caught fire, but the primary cause is carelessness in refuelling. A backfire, with its resulting shower of hot carbon particles on to the dry vegetation in a harvest field, has caused several summer fires, one of them resulting in the destruction of a header harvester and a field of grain and a house, outbuilding, and implement sheds.



This tractor caught fire when it was being refuelled and suffered minor damage, but it was out of use in a busy season when it was required for urgent work.

Fire Extinguishers

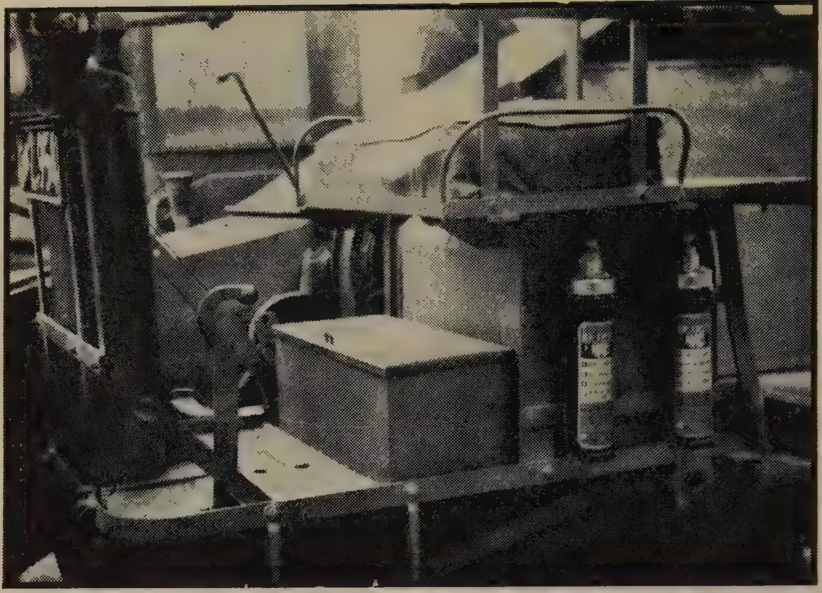
The type of fire extinguisher which should be fitted on each machine in the harvest field is the C.T.C. type, which contains a charge of carbon tetrachloride that will effectively blanket a fire but will not conduct back to the firefighter any electrical charge on the machine. Whereas a stream of water will conduct electricity, carbon tetrachloride will not, and an operator fighting a fire that is associated with electrical circuits is safe. This type of extinguisher is safe and efficient and forms a cheap means of ensuring that the harvest will be completed without loss of machinery by fire.

Where self-propelled header harvesters are being operated it is wise to fit two extinguishers—one to be used by the driver and the other by the man on the bagging platform so that each may work from opposite sides of the machine and so quell an outbreak of fire around the motor.

A case is on record where a self-propelled header harvester caught fire around the motor and the operator effectively fought it from one side with the extinguisher that was carried on the machine, but the fire came out of the other side of the header harvester and burnt the bagging platform, the screen, and all the V belts on that side. The machine was out of action for a month while repairs involving a cost of more than £160 were made.

Fighting a Fire

If a fire breaks out in a harvesting machine, the first step to control it is to disengage the clutch and then to stop the motor. Especially is this true with header harvesters. If this is not done, the radiator fan of the motor will fan the flames and spread them. In one case on record this happened and soon the fire started on the ground under the header harvester motor. It spread to the elevator canvases and was carried up into the machine, where the swiftly revolving drum fanned the flames again. The moving elevators carried the fire into each corner of the machine and every part was damaged. All woodwork was burnt partly or wholly and rubber V belts were destroyed. The ironwork was buckled and the paintwork destroyed. The machine was out of work for the season and the repair bill was over £500. This fire could have been prevented by stopping the build-up of combustible matter around the manifold and it could have been put out in the early stages if an extinguisher had been carried.



Fitting two fire extinguishers to self-propelled harvesters is a wise precaution. If a fire breaks out around the motor, it can be fought from both sides by the two header harvester operators.

Most machinery fires are noticed in the early stages, so that once the motor has been stopped one man with an extinguisher should be able to quell the fire while the other with a bag should be on the alert to stop any fires that tend to start on the ground. A small ground fire is quickly fanned into a fast-moving wall of flame in a harvest field under dry, windy conditions and it can cause untold damage.

The risk of fire in the harvest field is too great to allow the simple precaution of fitting a fire extinguisher to each machine—and preferably two on self-propelled machines—to be neglected.

☆

Stricter Control of Animal Imports

STRICTER control of animal importations, other than those of domestic stock, the adoption of adequate measures should an outbreak of foot and mouth disease occur in New Zealand, and extension of the authority of the Department of Agriculture are provided for in the Stock Amendment Act 1952, which became effective on 23 October.

THE Amendment Act authorises the Department of Agriculture to assume the responsibility, formerly that of the Department of Internal Affairs, of controlling the introduction or importation into New Zealand of mammals (other than domestic stock), birds, reptiles, etc.

To facilitate importations the Minister of Agriculture has granted general permission to any person to import:—

1. The carcass, or portion of a carcass, of any bird, reptile, or mammal for educational, museum, or scientific purposes.

2. Hides, skins, or fur of any reptile or mammal, provided they have been dyed, tanned, dressed, treated, or processed otherwise than by drying, freezing, or chilling.

3. Rabbitskins from Australia.

4. Bird feathers, provided they have been cleaned or dyed or otherwise treated. (A special permit must be obtained to import feathers in their natural state.)

5. Hatching eggs of domestic fowls, ducks, geese, and turkeys from Australia, provided certain conditions are observed.

Importers of fur skins for the manufacture of fur garments will receive individual permits from the Department of Agriculture to import "green" or untreated fur skins. It is still necessary to obtain a permit from the Minister of Agriculture to import hides or skins of horses, sheep, goats, pigs, dogs, deer, llamas, antelopes, buffaloes, and other ruminants.

Individual permits are also being issued to importers of feathers used by anglers for fly fishing.

Inquiries about permits should be made to the Animal Industry Division, Department of Agriculture, P.O. Box 2298, Wellington.

◆

Book Review

"Garden Lawns and Playing Greens": E. A. Madden

THIS book deals with the principles and practice of the establishment and maintenance of turf for pleasure and sports areas.

In the early chapters consideration is given to the soil conditions required to maintain a satisfactory lawn. Later chapters deal with sowing, the choice of seed, and the use of fertilisers.

General maintenance, with particular reference to weed and pest control, is also considered, and the book ends with a chapter on lawns for special purposes and special soil and climatic conditions.

—*S.H.S.*

Whitcombe & Tombs Ltd. **11s. 6d.**

Publications Received

"Fodder-Beet", P. J. Boyle. Commonwealth Agricultural Bureaux, Farnham, England. 5s. net.

"Sheepfarming Annual 1952", Massey Agricultural College, New Zealand. 10s.

◆

The Home Orchard in Summer

THE control of insect pests and diseases by spraying is the most important summer work in the home orchard. That work and cultivation, harvesting, and summer pruning are discussed in this article by C. E. K. Fuller, Horticultural Instructor, Department of Agriculture, Hamilton.

THE ambition of the keen home orchardist is to harvest sufficient fresh fruit to meet the family requirements during the season. Neglect of pest and disease control is the cause of many crop losses in the home orchard, and good control is largely dependent on correctly timed base or foundation sprays in early spring. Even if early sprays were not applied, it is not too late to save a fair proportion of the crop from insect attack and at the same time check the spread of fungous diseases.

[*National Publicity Studios photo.*

[*National Publicity Studios photo.*
A good crop of black currants.

Control of Pests and Diseases

The routine spraying programme for summer is outlined below:—

Pip fruit: Spraying every 18 to 21 days with lime sulphur at ¼ pint to 4 gallons of water should be continued to control black spot and powdery mildew. To this can be added lead arsenate, 1¼oz., and hydrated lime, 3oz., for the control of codling moth, leaf-roller caterpillar, and other chewing insects. Bordeaux mixture (4oz. of bluestone and 5oz. of hydrated lime to 4 gallons of water) may be substituted for sulphur on pear trees.

If pests such as woolly aphis, red mite, or scale insects appear about December or January, summer oil, 1/3 pint to 4 gallons of water, should be applied. This spray should not be applied within 14 days before or after sulphur sprays. Where red mite is serious two sprayings 10 to 12 days apart with summer oil will be needed. Lead arsenate, 1¼oz., and hydrated lime, 3oz., can be combined with this spray.

To mix summer oil pour the required quantity of oil into a clean vessel and add a slightly smaller quantity of water. Stir vigorously until a white emulsion is obtained, then add the required balance of water slowly while continuing to stir the mixture.

Stone fruit (excluding apricots): At intervals of 3 to 4 weeks to within 3 weeks of picking, lime sulphur at 4 fl. oz. and colloidal sulphur 1oz. to 4 gallons of water should be applied for the control of brown rot, shot hole, and leaf rust. Where leech on plum and cherry trees is troublesome D.D.T. (50 per cent.) at ½oz. to 4 gallons of water should be used.

Small fruits (other than strawberries): After the fruit has been picked Bordeaux mixture (4oz. of bluestone and 5oz. of hydrated lime to 4 gallons of water) should be applied for the control of leaf spot and cane spot. For raspberries, loganberries, and boysenberries lead arsenate, 1¼oz., should be added to control bud moth and leaf-roller caterpillar.

Citrus: Where leaf-roller caterpillars are troublesome D.D.T. (50 per cent.) at ½oz. to 4 gallons of water should be applied, the first spray early in December and a second in mid-January. In mid-February a spray of 1 pint of summer oil and 4/5 fl. oz. (5 teaspoons) of nicotine sulphate to 4 gallons of water should be applied for the control of scale insects, black aphis, and thrips. It should be repeated 3 weeks later.

YOUNG'S

THE PEDIGREE DIP ...

You get the advantage of our wide experience in the manufacture of tested and proven Sheep Dips. The name YOUNG'S is your assurance of satisfaction and highly efficient results. Here are some of the YOUNG'S lines YOU will want to use for the protection of your flock.

YOUNG'S "Green Label" PASTE DIP

This special non-arsenical Paste Dip combines Benzene Hexachloride ("Gammexane") and Phenols in a form which ensures that these ingredients are always present in sufficient strength to destroy keds (ticks) and lice.

★FOR HEALTHIER SHEEP USE—

YOUNG'S SHEEP DIPS

YOUNG'S SHEEP DIPS

JASON FINDS THE GOLDEN FLEECE

Sole Agents and Distributors for N.Z. for the full range of YOUNG'S PRODUCTS.
THE FARMERS' CO-OP. WHOLESALE FEDERATION (N.Z.) LTD.,
Dominion Farmers' Institute Building, P.O. Box 1124, Wellington.
And all Farmers' Co-operative Associations and their Agents throughout the Dominion.

YOUNG'S "Yellow Label" PASTE DIP

Gives efficient protection against Blowfly. Destroys keds and lice at one dipping. (Arsenical.)

YOUNG'S "Red Label" PASTE

For those who prefer a Derris-Arsenical Dip. YOUNG'S "Red Label" has a most impressive record of success in the extermination of all external parasites.

YOUNG'S DEFLY SPRAY

Contains D.D.T. Here is the sure, safe way of dealing with the Blowfly menace to sheep. Lethal to flies on contact. Prevents female flies from depositing eggs on fleece.

YOUNG'S FOOT ROT SOLUTION

Give your flock the protection offered by this proven line.

YOUNG'S FOOT ROT PASTE

Packed in 2lb. tins and ESSENTIAL for the protection of YOUR flock. YOUNG'S FOOT ROT SOLUTION and PASTE give absolute efficiency with economy in use.

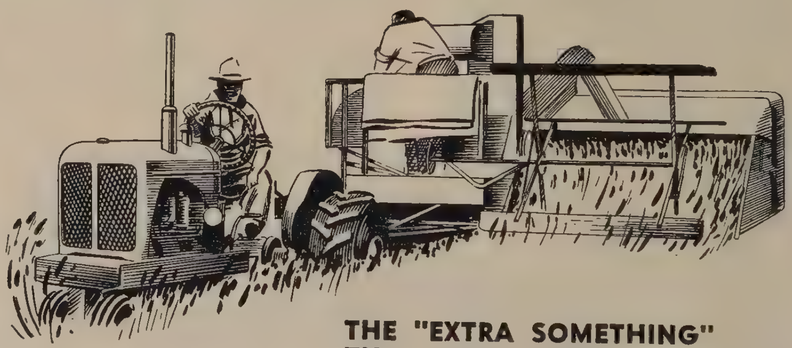
Simple to harvest

ANY CROP!

with your own

ALLIS-CHALMERS

ALL-CROP HARVESTER



THE "EXTRA SOMETHING" THAT PAYS YOU MORE

You're ready for each field, as soon as it ripens. You ride out in front, ahead of the dust and dirt. And your own tractor provides the power you need. It's the easy, low-cost way to harvest every threshable crop.

Wide-flow feeding steps up capacity tremendously . . . saves power, fuel and crop losses.

Now is the time to buy equipment to beat both the weather and the labour shortage.

The Air Blast Separation, with cushioned rubber; rubber threshing is easy on seed and straw. This action saves more grain and means less broken seed—puts more in the bag and more in your pocket. It's another reason why a new ALL-CROP Harvester should be your first choice.

SOUTH ISLAND DISTRIBUTORS

ANDREWS & BEAVEN LTD., Moorhouse Avenue, Christchurch.

BRANCHES: Invercargill (P.O. Box 5); Timaru (P.O. Box 145); Ashburton (P.O. Box 17).

AGENTS: Dunedin: Donald Reid & Co. Ltd. Oamaru: Ernest Reid & Co. Ltd. Leeston: R. A. Batt. Rangiora: Edlin Motors. Greymouth: West Coast Agencies. Nelson: Levin & Co. Ltd. Blenheim: W. G. G. Cuddon Ltd.

NORTH ISLAND DISTRIBUTORS

LEVIN & CO. LTD., P.O. Box 1496, Wellington.

BRANCHES: Auckland, Hastings, Pahiatua, Masterton, Feilding, Wanganui.

AGENTS: J. B. MacEwan & Co. Ltd.—Palmerston North, New Plymouth, Stratford, Hawera, Opunake. R. Young—Levin. Ward Motors—Marton. Williams & Kettle Ltd.—Wairoa and Gisborne. F. Butler Ltd.—Hamilton and Rotorua. Messrs. Kitt & Robertson—Tauranga. Newton King Ltd.—Hamilton, Huntly, Te Awamutu, Matamata, Putaruru, Te Kuiti. Donovan's Garage—Morrinsville. McLean Motors—Whakatane. Campbell McLean Ltd.—Ngatea. Wilson & Coombes—Te Aroha. North Auckland Farmers' Co-op. Ltd.—Whangarei and Branches. New Zealand Co-op. Dairy Co. Ltd.—Hamilton and Factories.

Citrus borer: One of the most troublesome pests of citrus trees is the citrus borer (*Aemona hirta*), which tunnels into twigs, branches, and trunks. Control methods consist of removing all dead and unhealthy twigs and small branches—as the borer frequently enters the tree through such growth—and of injecting into the tunnels a small quantity of a recommended disinfectant fluid (diluted with an equal quantity of water) or neat petrol with an oil can. Tunnels in which a borer is active can often be detected by the wood dust which is expelled. Small branches injured by the borers should be removed and burnt. The grubs can sometimes be killed by probing the borer holes with a piece of wire. Large cuts or injured tree parts should be coated with bituminous paint or heavy-grade petroleum jelly to prevent further infection.

Tree tomatoes: Downy mildew is usually prevalent on the foliage at this time of year. Control is gained by spraying with lime sulphur, ¼ pint to 4 gallons of water, at intervals of 3 to 4 weeks until at least the end of March.

Grape vines: Where powdery mildew (oidium) is troublesome grape vines should be dusted with flowers of sulphur three or four times while the fruit is developing and until it begins to change colour. Dusting should be done when conditions are warm, as sulphur is not effective at low temperatures.

Under glass a humid, stagnant atmosphere with a temperature above 58 degrees F. is favourable to the development of powdery mildew. Fresh air is essential for control of this disease, but draughts should be excluded.

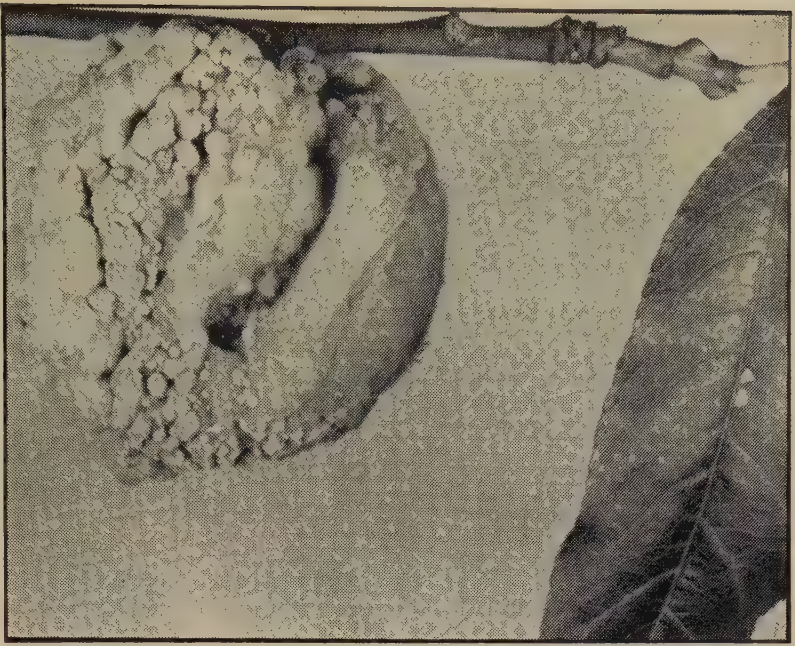
Where mealy bugs or thrips are troublesome 50 per cent. D.D.T. wettable powder at ½oz. to 4 gallons of water should be used at 3-weekly intervals. Spraying should cease 6 weeks before harvest.

Harvesting

Unlike the commercial grower, the home orchardist may carry out spot picking fully, that is, picking mature fruits every day or two. Picking over a long period has a similar, but less marked, effect to fruit thinning in late spring or early summer in that it allows the fruit remaining after each picking to have a higher proportion of the sugars manufactured by the leaves.

Usually fruit is ready for harvesting when it will part readily from the spur, lateral, or plug (of some small fruits) to which it is attached. Other signs of near maturity are changes in the colour of skin and pips and the flavour. The fruit at the top or on the outside of the tree or bush usually matures first. The remainder should be picked as the colour and size develop with maturity.

Pears, however, attain best eating quality when picked in firm condition and ripened at room temperature. As soon as sound pears begin to drop (depending on variety) picking should be started, as fruit, if left longer, is liable to go mushy at the core before reaching the best eating stage. Most of the summer and autumn apples ripen over a fairly long period and each fruit may be left on the tree until it is nearly ready to eat. Long-keeping varieties, however, should be picked while still too hard for eating.



[*Shell Photographic Unit, London, photo.*

Brown rot on peach. The fruit shown is capable of carrying over infection to the following season and fruit such as this should be destroyed.

Stone fruit is best harvested when the flesh gives easily without being soft, strawberries when fully coloured, currants when fully ripe, gooseberries when of suitable size, and other small fruits (raspberries, boysenberries) when firm ripe.

All fruits during picking should be handled with care to avoid unnecessary injury or bruising, as if they are damaged in any way, their keeping qualities are greatly impaired.

Fruit should be placed in the picking receptacle not dropped, thrown, or poured into it.

Summer Pruning

Summer pruning, especially if done after growth has been completed, is not generally recommended. Summer pruning reduces the leaf area, which is responsible for building up food material for future tree growth, and consequently tends to reduce growth in the following season.

Exceptions are:—

Young trees: During the growing season if any leaders are found outstripping others, dominant shoots should be pinched back to bring about an evenly balanced tree. In addition, undesirable shoots should be removed during the first 10 to 14 weeks of growth.

Dwarf trees, etc.: Summer pruning of dwarf trees closely planted, espaliers, and cordons is regularly practised overseas, and with the recent introduction to New Zealand of apple trees worked on the East Malling IX stock (dwarf stock) it will be advantageous to summer prune these trees, except dwarf bush trees, where winter pruning is usually sufficient.

Summer pruning should be done little by little through January and February so that there is no upset of the tree. Thus all laterals 1ft. or more long should be shortened in mid-January, the more backward shoots being treated later as they develop. Pruning should cease at the end of February.

All shoots required to form new branches and those which are suitable for continuing the growth of the existing framework should be left unpruned.

Pears, plums, cherries, and apricots trained on the espalier system may be treated in the above manner also.

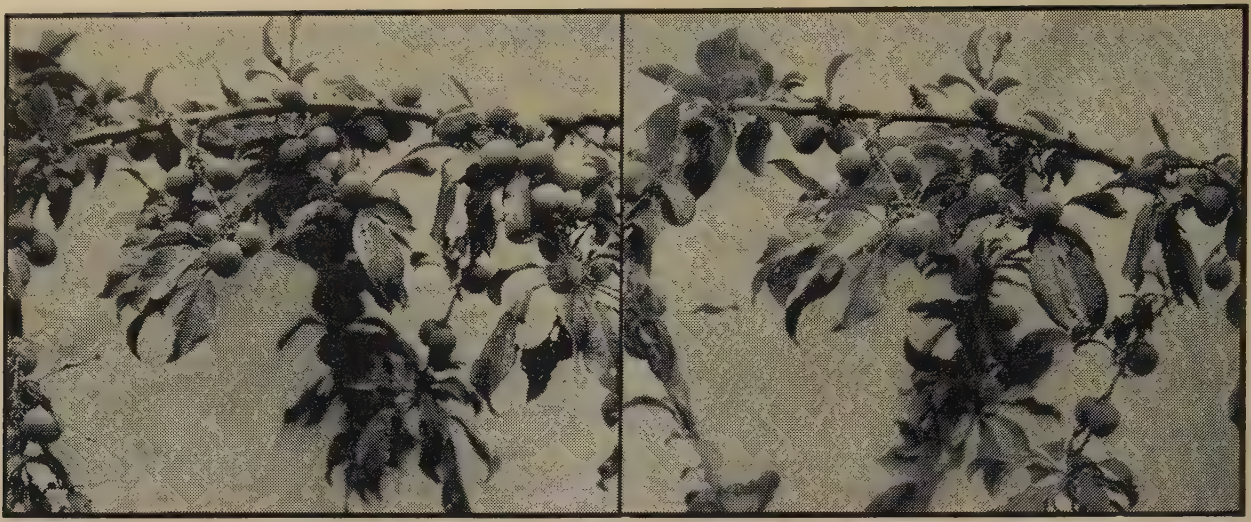
Summer pruning allows more sunlight into the trees and encourages better development of fruiting wood while discouraging excessive wood growth in the following season.

Other Work

After care of grafts: Sealing wax should be checked regularly for cracks and any ties (raffia, grafting tape, etc.) previously overlooked should be cut away. Shoots arising from the stock and competing with the scion must be removed. Where necessary grafts should be tied to stakes or other branches to prevent breakages through wind.

Thinning should be completed by mid-January, allowing not more than three fruits per cluster for apples and pears. Twos or singles are preferable. Stone fruit should have been thinned to twos or singles.

Whenever thinning is done opportunity should be taken to remove all deformed or diseased fruit. This operation may be continued throughout the growing period. All thinnings should be collected and destroyed to



Fruit thinning. Left—Plums before being thinned. Right—Plums after being thinned.

prevent them from becoming sources from which disease may spread.

Cultivation should be confined to light surface hoeing around the trees to prevent the loss of soil moisture by killing weeds and creating a good soil mulch. This is particularly important for newly planted trees.

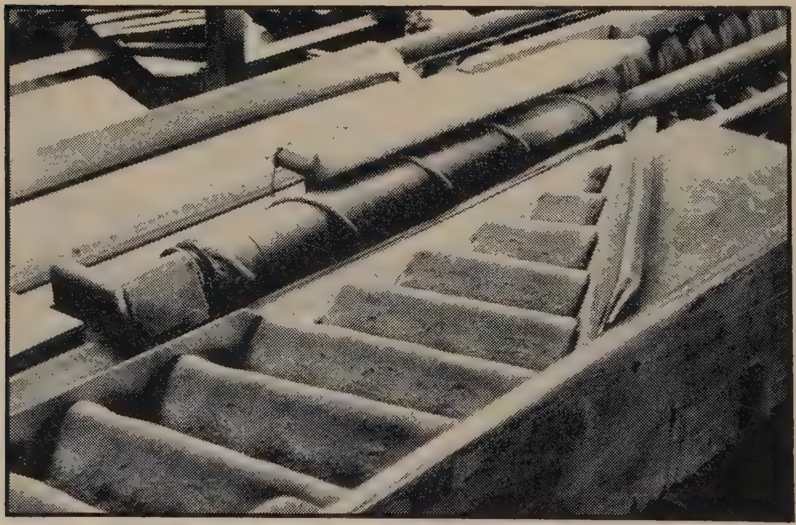
Where the orchard is lawn the grass must be kept short if rainfall is insufficient during the growing season, to avoid undue competition between grasses and trees for soil moisture. A grass catcher need not be used, as the clippings return valuable nutrients to the soil.

Apple trees on dwarf stock: Care should be taken at planting to see that the bud union is not buried below soil level or that soil is not banked around the union during cultivation. Should this happen the scion or variety of apple budded on to the stock may take root and the dwarfing habit of the tree may be lost. Dwarf stocks are prone to suckering. Suckers should be removed with a sharp knife as they appear. Where trees are exposed to wind they should be staked for added support until they are well established.

Good hygiene is an essential part of disease control. All fallen fruit should be picked up regularly from under trees and, if of little value, destroyed by burning or deep burying. Fallen fruits provide excellent overwintering hosts for disease.

☆

Attachment to Improve Feed of Screw-type Fruit Grader



[*R. W. Orr photo.*

IT is important to be able to operate a fruit grader at its full capacity when required. The sorting table and feed should be such that the sizing section is fully supplied at all times. Most types and makes of fruit grading machines have faults, but these are usually associated with the sizing part of the equipment and are difficult to overcome. However, when the fault is in the grading table and feed it can often be rectified.

Difficulty is often experienced with the feed of the standard sorting table of the New Zealand-made screw-type grader. The fruit tends to block when it leaves the rocker table and is forced on to the conveyer belt, causing crowding just before it drops on to the screws.

A simple device consisting of a roller of about 2½in. in diameter placed in wooden block or steel bearings at either end overcomes the blockage very efficiently. The illustration shows the method of attachment.

The roller can be of any length from about 15 to 24in., an old wringer roller being quite suitable. It should be fitted almost parallel to the conveyer belt but slightly closer at the bin end, and at a suitable distance from the belt to keep the fruit running freely without lodging. The correct position is easily found, and the provision of slotted holes in the table will allow finer adjustment.

The roller is driven by a short round belt or V-belt from the drive shaft just below. The belt can be fitted into a groove on the roller itself, but a pulley is necessary on the drive shaft and should be about the same size as the one shown. The illustration shows a guide rail above the roller, but if the roller is in the correct position, this is not necessary. This roller, like all other parts of the sizing and grading equipment, should be kept clean and free from grit to prevent marking and other damage to the fruit, which mars its appearance and may reduce its storage life.

—R. I. JUNE,
Horticultural Instructor,
Department of Agriculture,
Hastings

Bluestone Absorbed by Wool Affects Processing

By L. F. STORY, Acting Director, New Zealand Woollen Mills' Research Association, Dunedin

BLUESTONE (commercial copper sulphate) is a cheap and effective germicidal chemical which is being increasingly used by the sheep farmer for various purposes. Unfortunately some of the copper is absorbed by the wool and may cause trouble in its subsequent processing by causing stains or by interfering in dyeing and producing wrong colours. Experiments have been made to find how much copper may be absorbed by wool and how much can be tolerated without interfering in manufacturing processes.

BLUESTONE is being used by sheep farmers for three purposes at different concentrations—in B.H.C. dips ("Gammexane", "Lindane"), in dips to counteract mycotic dermatitis (lumpy wool), and in foot-rot baths.

When sheep are dipped the fleeces are saturated with dipping solution and allowed to drain. A considerable amount of the solution is retained by the fleeces (roughly a gallon per sheep with 6 months' wool) and gradually dries out, leaving behind the constituents of the dip. Thus when bluestone is used some of this is dried into the fleece. Much of the copper of the bluestone forms a compound with the yolk and is removed with this when the wool is scoured. Some of the copper, however, combines with the wool fibres themselves and cannot be removed by scouring. It is this part of the copper that may be responsible for manufacturing faults.

Amount of Copper Absorbed

"Gammexane" Dips

"Gammexane" has been found to be an effective agent against external sheep parasites and is now being widely used in New Zealand and elsewhere for this purpose. When it was first used it was found that if the dipping bath was kept for several days or even weeks instead of being made up freshly and used immediately for the annual dipping, the sheep dipped in it frequently went lame because of the development of bacteria named *Erysipelothrix rhusiopathiae*. Research showed that this could be prevented by the addition of bluestone at the rate of 3lb. per 1000 gallons (0.03 per cent.), and this amount is now incorporated in most "Gammexane" dips as a standard practice.

Wool samples have been analysed after scouring to find how much copper they contained. Most of them had less than 20 parts per million (p.p.m.), which is not likely to give any extra trouble, since similar traces of copper are liable to be picked up during processing from the brass parts of some of the machines, etc. A few samples showed up to 75 p.p.m., which is enough to affect sensitive dyes. However, the dyer would be very unlucky if he got some of this wool to dye, as the chances are that it would be blended with wool containing little copper, thus reducing the average copper content of the whole to a safer level.

As the final copper content of the wool would be expected to be roughly proportional to the length at dipping, since the longer the fleece the more liquor would be retained, it is undesirable to delay dipping until late in the season, especially for early-shorn wools.

Dips for Mycotic Dermatitis

Mycotic dermatitis is a skin disease which appears to affect mainly fine-woolled hoggets, particularly in Central Otago. The incidence of cases varies considerably from year to year and is generally higher in wet seasons. It is caused by a fungus called *Actinomyces dermatonomus*, which is allied to ringworm and like that disease affects small circular patches of skin. Exudate forms on these and hardens into horny conical or cylindrical masses which seriously interfere with shearing and the subsequent processing of the wool.

In Australia L. B. Bull suggested that dipping hoggets in a bluestone solution of 1 part in 500 toward the end of autumn should be effective in preventing the development of the disease. This method has been tried in New Zealand and appears to have beneficial results. Some farmers also dip affected sheep soon after shearing to cure them of the disease.

To find how much copper might be expected on wool when sheep have been dipped in bluestone solutions some of the Corriedale flock at Canterbury Agricultural College, Lincoln, were dipped in May 1951 by courtesy of Dr. A. E. Henderson. Three concentrations were used, 1 in 2000, 1 in 1000, and 1 in 500, and samples of the wool were taken for analysis in June and August and when shorn in November. The sheep had also been dipped in January 1951 in an ordinary "Gammexane" and bluestone dip.

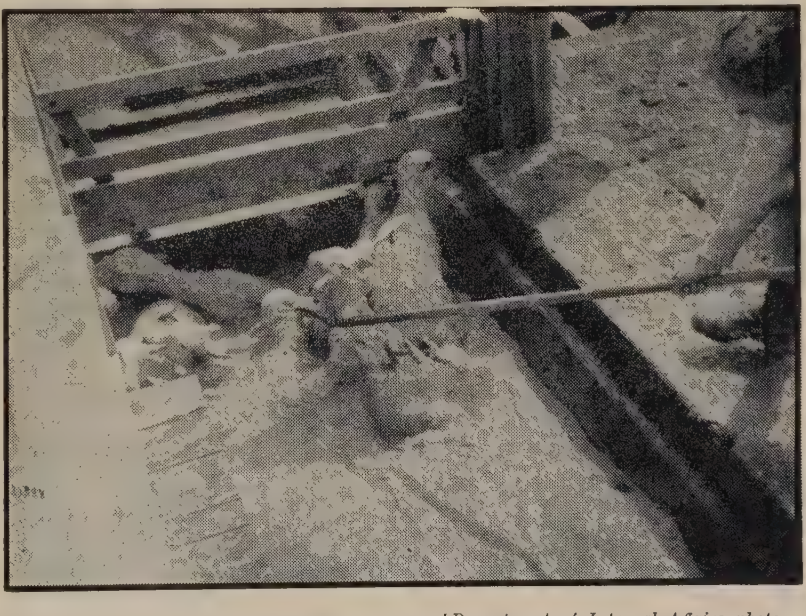
The results of the analyses of the wools after scouring showed that many of the samples contained considerable amounts of copper, most of which was of course concentrated in the tip half of the staple. The copper concentration varied considerably from sheep to sheep, and also in samples from different parts of the same sheep. It was usually highest in samples from the rump and lowest in belly samples. The average copper contents of the shorn samples were as follows:—

Bluestone concentration*	Copper content p.p.m.
Nil	45
1 in 2000	89
1 in 1000	147
1 in 500	286

* All the sheep had been dipped earlier in a "Gammexane" dip with 3 parts of bluestone in 10,000 parts of water.

The copper concentration was approximately proportional to the bluestone concentration, as might be expected, and the copper was lost to only a relatively small extent by weathering, though the percentage on the full staples was naturally reduced in proportion to the amount of fresh wool grown since dipping. For example the 1 in 2000 samples taken in June averaged 200 p.p.m. of copper, and after another 5 months' growth the average copper content was still 89 p.p.m.

In this case also the copper content would be expected to be related to the length of the staple when dipping, and when the sheep are dipped "off the shears" low copper figures would be expected. However, some samples of crutchings taken 6 months after sheep had been dipped off the shears in 1 in



[*Department of Internal Affairs photo.*

Bluestone may be added to dips such as this as a bacteriostat or used by itself in weak solution for controlling mycotic dermatitis.

HERE'S WHY
POWER
CULTIVATION
is faster, more profitable with a
ROTAVATOR
Gem

Differential lock reduces fatigue—There's no wrestling with a Rotavator "Gem". Differential ensures easier turning on corners and tricky headlands.

Complete control from all angles Handlebars of the "Gem" adjust both vertically and horizontally, allowing you to operate **from the side** without walking on cultivated soil. You can also work much closer to hedges, fences or rows of trees without danger of losing control.

3 forward speeds plus REVERSE—The gearbox of the "Gem" is the last word in **efficiency.** In addition to its 3 forward speeds, the "Gem" is fitted with **reverse** for increased manoeuvrability.

6 h.p. J.A.P. engine—Nearly the power of a small car! The specially adapted engine of the "Gem" is designed to pull like a draught horse on heavy soil or steep, difficult grades.

Rotavators are entirely made in England by Rotary Hoes Limited — largest manufacturers and exporters of Rotary Hoes in the British Commonwealth.

See your ROTAVATOR DEALER or write Rotavators Ltd., P.O. Box 705, Palmerston North.

DROUGHT
THE FARMER'S
WORST ENEMY

It may not come this year—or next—but it will pay you well to guard against the havoc of a dry spell by investing in a **SIGMUND RAINMASTER. SIGMUND** manufacture a wide range of irrigation equipment and pumps for every purpose. We have the answer to your problem. Write for the name of your nearest agent.

B. R. HOMERSHAM LTD.
Irrigation Counsellors,
126 VICTORIA STREET, CHRISTCHURCH. P.O. BOX 280.

Men of Action
drive on SHELL

An ace jockey astride a champion racehorse is a perfect example of balanced blending. Balanced blending is the secret, too, of Shell Motor Spirit. The world's best petroleum team is united to give you a balanced blend for easy starting, clean combustion, maximum power per gallon. It's easy to see why . . .

more motorists use **SHELL** *than any other spirit*

SHELL X-100 MOTOR OIL FIGHTS ACID ACTION

The Shell Company of New Zealand Limited (Incorporated in England)

250 bluestone contained up to 270 p.p.m. of copper and the final copper contents would probably range up to 100 p.p.m.

If the sheep were dipped more than once, higher copper contents would be expected, probably proportional to the number of dippings.

Sixty p.p.m. of copper will affect sensitive dyes, so it is obvious that the wools averaging the high contents noted will be liable to cause processing troubles. A number of the samples were slightly green because of the copper, the presence of which could therefore be recognised. Others were unstained so that the presence of copper could be detected only by chemical analysis. However, when these samples were dyed the effect of the copper was readily seen, as they turned purple instead of blue, blue instead of green, straw instead of brown, and so on. Thus the dyer would have no warning of the presence of copper and would find it only when he tried to dye the wool with a dye sensitive to copper, and then it would be too late.

Foot-rot Baths

Foot-rot is a disease caused by bacteria (*Fusiformis nodosus* and *Spirochaeta penortha*) picked up from the soil and can be controlled by applying a concentrated bluestone solution. This is usually done by making the sheep walk through the solution contained in a long, narrow trough so that they have to go single file. In theory only the feet of sheep come into contact with the solution, but if the sheep are hurried they may splash the solution over one another, fall down in the trough, or put their feet on the backs of other sheep, so contaminating the fleeces with the concentrated solution. This will cause deep green stains containing a lot of copper; for example, a stained greasy wool sample was analysed and found to contain 3 per cent. of bluestone. Such staining should be avoided as much as possible by careful handling of the sheep, since it will probably cause the lot to be penalised in the sale room, besides causing much trouble in the mill.

Effects of Copper in Processing

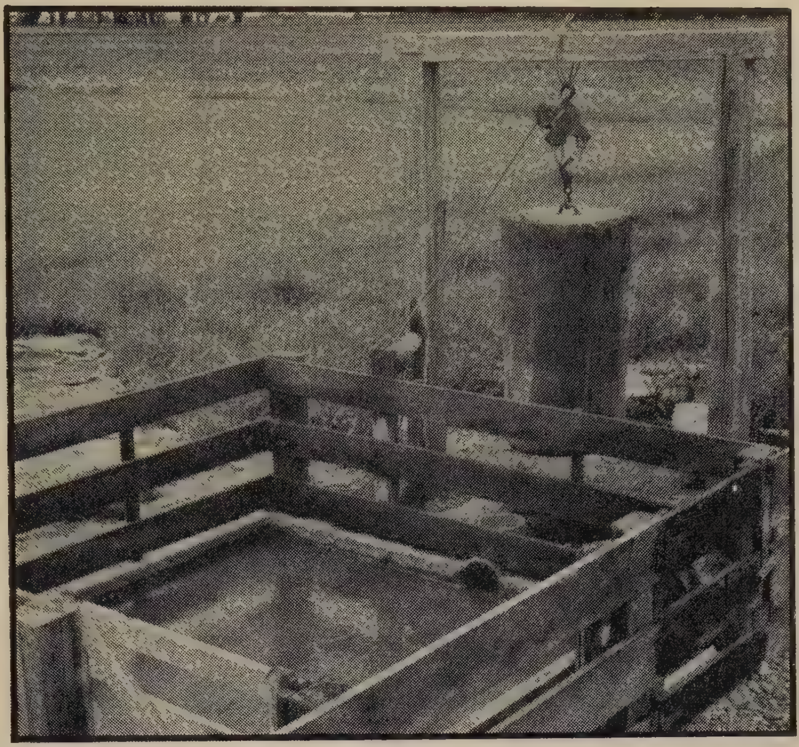
Copper gives most trouble in dyeing, but it is also the cause of brown stains and it interferes in bleaching.

Dyeing

Copper interferes in the dyeing of many chrome dyes, as a compound is formed between copper and the dye in preference to the desired compound between chromium and dye. As the copper compound frequently has a different colour, the resulting dyeing is off-shade, the degree of off-shade depending on the relative proportions of dye and copper. Thus the more copper is present the further will the shade be wrong, and conversely with a given amount of copper a light dyeing will be much more affected than a dark dyeing.

Dyeing tests with wool containing known small amounts of copper put on in the laboratory have shown that 60 p.p.m. is enough to have a considerable effect on a fairly light dyeing of a copper-sensitive dye, though a very pale dyeing is affected by as little as 15 p.p.m. In the fleece wools the effect of copper is accentuated, since it is concentrated toward the tip end, whereas it was evenly distributed in the laboratory-prepared samples. Thus the fleece wools would dye very "tippy"; that is, the root end would be nearly the proper "chrome" colour, while the tip would be the different "copper" colour.

The class of dyes affected is unfortunately the one which has the best fastness to washing and light, etc.



Bluestone is used in either troughs or baths for foot-rot control. The main drawback is splashing and staining of the wool, but this is minimised in the bath shown.

Stains

Appreciable amounts of copper may be present without producing a green stain, but if the copper is converted into copper sulphide, a smaller amount becomes evident owing to the development of a brown discoloration. This change is liable to occur at any stage in processing where the wool is heated while damp or wet. Copper at 100 p.p.m. has been found to be enough to produce staining under these conditions.

Bleaching

When wool is bleached with hydrogen peroxide the presence of copper causes rapid decomposition of the peroxide and discolours the wool instead of bleaching it.

Results of Experiments

The results of experiments thus show that only small amounts of copper can be tolerated if the wool is to be dyed a light shade with a copper-sensitive dye and to avoid the development of stains. The quantities of copper found on scoured samples of wool from sheep that had been dipped in bluestone solutions were much more than could be tolerated. However, in practice, owing to the blending and mixing of wools from various sources, the copper-containing wool would probably get mixed with enough other wool containing only normal, small amounts of copper so that the average copper content would be low enough not to cause any trouble. But if any considerable proportion of the wool clip were to be dipped in bluestone solutions (other than the small amount used in the "Gammexane" dip), the proportion of copper-contaminated wool would probably be such that the average copper content would not be sufficiently reduced by blending, and annoying and obscure dyeing faults and stains might then occur. Further, in a large clip the wool might not be mixed with much other wool before processing, or as it is hogget wool that would most likely be affected, this might be blended (unknowingly) with other similar wools also contaminated with copper, and so the final blend might still contain considerable amounts of copper.

Conclusions

The amount of copper remaining in wool from sheep dipped in "Gammexane" and bluestone is usually small enough not to affect processing of the wool. Much larger amounts remain after dipping at concentrations recommended against mycotic dermatitis and such dipping, except perhaps on a limited scale, is undesirable from the point of view of the wool user. There is no direct objection to the use of concentrated solutions of bluestone as foot-rot baths provided care is taken not to splash or otherwise contaminate the fleece.

Care of Livestock during January

Contributed by the Animal Research Division

WEANING LAMBS

WEANING is an important event in the life of a lamb and special care at this time will be well repaid. Long-wool lambs should be shorn and all others crutched. Weaning is the most important time for drenching against worms, which is especially necessary in wet summers. A full dose of 20 gm. of phenothiazine should be given. If fattening crops are not available, lambs should be drafted into "clean" paddocks after being drenched. Lambs should never be weaned into paddocks in which ewes and lambs have been grazed during the previous month. Unless very good paddocks of spelled pasture are available, hoggets should be spread thinly over as large an area as possible.

CULLING OF EWES

After lambs have been weaned the ewes should be gone through carefully to select those which require culling. Feet and wool should be examined carefully. Special attention should be paid to udders and teats, and ewes should be culled if they have defective udders or very large or damaged teats, as the lambs of such ewes often die from starvation before they are a week old. On good fat lamb farms too much attention is often paid to teeth. Provided ewes are in reasonable condition and have sound udders and good fleeces, they should be retained. Even "gummy" ewes will rear satisfactory lambs on good pasture. Lambing percentage increases with the age of the sheep and reaches the highest level when the ewes are 5 to 8 years old. Many ewes on fat lamb farms could well be kept for 1 or 2 years longer, but fat ewes which have not reared a lamb should be culled. Ewes should be kept on low rations for 2 months after weaning to prevent their becoming over-fat.

ERGOTISED GRASS MAKES DANGEROUS HAY

Serious lameness in cattle can be caused by their eating hay heavily infested with ergot. Such hay can be easily recognised by the black ergots which replace the seeds of ryegrass and other grasses. Where ergot is known to occur hay should be made before the grasses have time to seed.

FODDERS FOR LAMB FATTENING

Rape should not be grazed by lambs until the leaves show a purplish tinge. "Unripe" rape does not fatten lambs so quickly and seems to "scald" them more readily. Best results are probably obtained by grazing rape in breaks which last the lambs about a week. Keeping lambs on a break until the last leaf is eaten is false economy; they should be moved on while they are still getting a full feed, and the paddock can be cleaned up with ewes. Run-offs have little to recommend them, and unless they contain good pasture they will depress the lambs' rate of growth. If hay is fed, it must be of the best quality. Thousand-headed kale is splendid lamb-fattening fodder, but because it is relatively unpalatable it must be managed properly. It must always be fed in small breaks and grazed only lightly before the lambs are moved on to the next break. Use of a run-off is not advised. Treated in this way, kale makes excellent regrowth and can be grazed several times; if necessary, grazing can be extended into autumn and winter.

ST. JOHN'S WORT MAKES DIPPING DANGEROUS

Sheep that eat St. John's wort become sensitive to sunlight and develop scabs on the ears, face, and back. If sheep in such a condition are dipped, they take convulsions and may be drowned. If possible, sheep should be grazed on country free from St. John's wort for several weeks before they are dipped. If that is not possible, they should be dipped only on dull days.

[*E. F. Neilson photo.*

DIPPING OF SHEEP

Modern sheep dips are so effective that the eradication of lice and ticks should be quite feasible. However, best results will be achieved only if the instructions for mixing and replenishing dips are followed accurately. Carelessness in dipping can cause disastrous losses. If sheep are dipped off shears, the shear cuts are likely to become infected and deaths from blood poisoning may occur, but this can be prevented by vaccinating the sheep with blackleg vaccine at least a fortnight before dipping them. The vaccine is available at a reasonable price. Departmental Veterinarians or Livestock Instructors should be consulted about its use.

ERADICATION OF FOOT-ROT

Campaigns for foot-rot eradication should be started as soon as the lambs have been weaned. Once foot-rot has been eradicated from a flock it does not recur unless it is reintroduced from outside. Department of Agriculture Bulletin No. 325, "Foot-rot in Sheep Can be Eradicated", gives instructions for such campaigns.

◆

Dairy Produce Graded for Export

THE following figures showing quantities of dairy produce graded for export during October and for the 3 months ended 31 October 1952, with comparative figures for the same month and 3-monthly period of 1951, have been compiled by the Dairy Division of the Department of Agriculture from figures supplied by divisional officers at the various grading ports:—

BUTTER

Period	Tons			Percentage inc. or dec.
	Creamery	Whey	Total	
October 1952	23,470	417	23,887	—
October 1951	22,196	366	22,562	—
Increase or decrease ..	+1,274	+51	+1,325	+5.872
3 months to 31/10/52 ..	48,822	806	49,628	—
3 months to 31/10/51 ..	44,462	713	45,175	—
Increase or decrease ..	+4,360	+93	+4,453	+9.857

Butter in store at 31 October 1952 was 12,320 tons

CHEESE

Period	Tons			Percentage inc. or dec.
	White	Coloured	Total	
October 1952	13,188	12	13,200	—
October 1951	11,683	8	11,691	—
Increase or decrease ..	+1,505	+4	+1,509	+12.907
3 months to 31/10/52 ..	22,070	19	22,089	—
3 months to 31/10/51 ..	19,571	10	19,581	—
Increase or decrease ..	+2,499	+9	+2,508	+12.808

Cheese in store at 31 October 1952 was 6,800 tons

If these figures are converted into butterfat equivalent, there is an increase of 10.483 per cent. in butterfat graded for the 3 months as compared with the corresponding period of the preceding season. It should be noted that the above figures refer only to butter and cheese graded for export, and that owing to diversions which may take place from time to time, they are not necessarily a true indication of production trends.

◆

Pasture Management and Threshing of Clover

Seasonal Notes by the Extension Division

CONSIDERATION should be given at this time of year to seed-bed preparation and mixtures for autumn-sown pastures. Both are important for the future success of the pasture. The seed-bed for grass should be fine, firm, and moist at the time of sowing, and such a seed-bed is often most easily secured after a summer fallow.

DAIRYING PASTURES When pastures are being sown in autumn advantage can be taken of the ability of short-rotation ryegrass to establish rapidly and to produce feed during winter. On fertile and well-drained dairying land the following mixture per acre is recommended for high production over a long period: Certified perennial ryegrass 20 to 30lb., short-rotation ryegrass 10 to 15lb., Certified cocksfoot 6lb., Certified red clover 3lb., and Certified white clover 3lb. In colder districts timothy may be used to replace part or all of the cocksfoot. Paspalum is often sown in warmer districts, but should not be sown in an autumn-sown mixture. The above mixture will, if break fed, provide good winter and spring feed as well as suitable hay after the first year.

SHEEP PASTURES For most sheep pastures reliance must be placed on plants such as perennial ryegrass, crested dogstail, and white clover which will stand severe grazing for at least some of the year. On better country a suitable mixture consists of Certified perennial ryegrass 25lb., Certified short-rotation ryegrass 5lb., crested dogstail 2lb., Certified cocksfoot 6lb., Certified red clover 3lb., and Certified white clover 3lb. On country that dries out sufficiently in summer to affect the survival of white clover, subterranean clover should be sown at 3lb. per acre and white clover reduced to 1lb. per acre.

SPECIAL-PURPOSE PASTURES Though any pasture should be regarded as being sown for a special purpose, there are also several which are sown for a more particular use. On rich, warm dairying country a mixture of prairie grass 70lb. and white clover 3lb. is sown for feeding off in winter and early spring. Prairie grass is also sometimes included in general mixtures at from 10 to 20lb. per acre.

In recent years lucerne at 15lb. per acre and cocksfoot at 2lb. per acre have been sown in the drier districts to provide summer grazing. *Phalaris tuberosa* has been sown extensively in some dry districts, but until more is known of its performance its use cannot be advocated generally.

—*S. H. SAXBY*

* * *

ROW CROP CULTIVATION THE aims of inter-row cultivation are to control annual weeds, to maintain soil aeration, and, with hillside crops, to ensure for as long as possible the absorption of rain-water and to prevent loss by run-off. Inter-row cultivation should be shallow, as annual weeds are most effectively killed by cutting the roots just below the surface. Deep cultivation is undesirable, as it brings more weed seeds to the surface, where they will germinate, the lateral roots of the crop in the inter-row area are severed, and unnecessary evaporation of soil moisture takes place.

—*H. A. BROWNING*

* * *

THRESHING OF CLOVER MOST clover crops are now threshed with header harvesters and considerable care is needed in setting of and adjustments to the machines to minimise losses in threshing and in damaged seed. Investigations by officers of the Extension Division indicate that within reasonable limits drum speed and drum clearance on the header have little influence on white clover seed damage, but that the condition of the swath at the time of threshing is most important.

If the swath is damp, the header drum is usually screwed down and speeded up to thresh out the seed, and damage to seed results. Alternatively threshing under hot, dry, north-west conditions can also cause damage, because the seed becomes too brittle. Correct condition for threshing lies between these two extremes.

THE CLOVER SWATH Judicious grazing before closing up the field will assist in controlling ryegrass, a little of which is needed to lend "body" to the clover swath after it is cut, but too much of which will tend to lengthen the drying period. The swath should have body and be even along its length, but it should not be so dense as to impair drying out, and use may have to be made of a second divider board on the mower to counteract this.

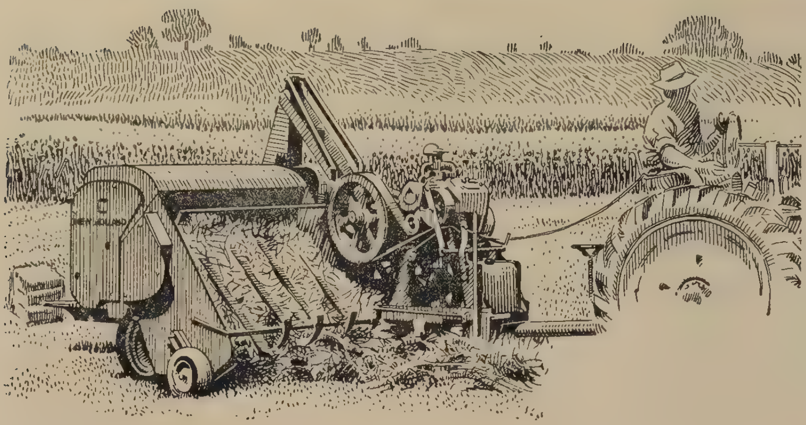
THE AERATOR If intermittent showery weather is encountered after cutting, it will be found that on sunny days the top of the swath is fit for threshing but the under side, in contact with the ground, is damp and unfit, and that before the swath dries out completely rain falls again and the harvesting is delayed. A machine which has a tremendous influence on harvesting under these conditions is the aerator, which gently lifts the swath and deposits it back on the stubble so that the drying winds can move under and through it to complete drying in a few hours. Heading can often be carried out in the afternoon on swath so treated in the morning, enabling considerable areas to be saved on suitable days.

HEADER SETTINGS The header should be set at the maker's specifications for threshing clover, and the sample obtained should be examined for damaged and broken seed. The latter can easily be seen by the naked eye, but a magnifying glass is essential for the proper identification of cracked seed. The final setting of the drum should be the widest concave setting and the slowest speed that will thresh the seed efficiently. The wind blast must be set to give a reasonably but not excessively clean sample, because clover seed can easily be blown right off the riddles. It is better to leave the finer points of seed dressing to the specialised plant available at seed-dressing depots than to attempt to obtain an excellent header sample and lose seed in the process.

Efficient harvesting with a header is largely a matter of common sense and logical deduction from a periodical examination of the sample and the cavings throughout the day, for conditions can and do vary on any one day. Under very hot, dry conditions inland it may be necessary to stop harvesting at midday, when the swath has become too dry and brittle, and resume in the afternoon when the swath has reabsorbed sufficient moisture; on the coast the cooler, damp easterly winds that come in the afternoon may bring back the swath so rapidly that harvesting must stop early in the afternoon.

—*C. J. CROSBIE*

Up to 10 tons of hay per hour!



NEW HOLLAND
Models
'77 and 80'
BALERS

The New Holland Baler is so gentle in its pick-up action that it preserves the valuable protein laden leaves and blossom so often shaken out and lost by ordinary haymaking methods. New Holland bales sliced like bread for scientific feeding keep the Hay fresh and dust free the year round.

Available in Model 77 Twine Tie Baler and Model 80 Automatic Wire Tie Baler. Priced from £1290.

DORING IMPLEMENT SUPPLIES LTD.

P.O. Box 1179, Wellington. ● P.O. Box 548, Palmerston North. ● P.O. Box 1203, Christchurch.
P.O. Box 632, Hamilton. ● P.O. Box 99, Gore.

WEEDONE SPECIAL 2,4,5-T
kills profit-stealing GORSE

This is profit land
WEEDONE CONTROLLED
Why let profits stop
at the gorse line?

One spraying with WEEDONE SPECIAL 2, 4, 5-T now will deliver a knock-out punch to the Gorse pest because Gorse is now at its most susceptible stage. Applied at 1 gallon to the acre of medium growth, WEEDONE SPECIAL 2, 4, 5-T penetrates fastest at this time of the year . . . gets right down into the root system and kills Gorse from the roots up! All that remains are brittle, stripped stems that are quickly and easily cleared away.

If Gorse is as serious on your farm as in the photograph on left, use this "spray and clear" treatment with WEEDONE SPECIAL 2, 4, 5-T. You'll knock the Gorse line back and back, enabling you to reclaim land that soon becomes productive, profitable pasture. Where infestation is serious you can call on the trained knowledge of Weedone Service Contractors.

ACT NOW! ***Post this coupon to your nearest Weedone Service Distributor or Co-distributor. There is one in your district.***

Please send me full information and costs for complete Gorse Control. My property has
.... acres of Gorse .... ft. high.
NAME ....
ADDRESS ....
....

Proven Product of IVON WATKINS LIMITED, Box 124, New Plymouth.

Cauliflower Mosaic: A Virus Disease of Brassicas

By P. R. FRY, Plant Diseases Division, Department of Scientific and Industrial Research, Auckland

CAULIFLOWER mosaic was first recorded in the United States of America by Tompkins (1937) and has since been found in many other countries. In New Zealand it was first observed attacking cauliflowers at Lincoln, Canterbury, and has since been found on a number of other *Brassica* species in both field and market garden crops throughout the country.

THE symptoms in cauliflower, cabbage, chou moellier, swede and rape, turnip, and Chinese cabbage are as follows:—

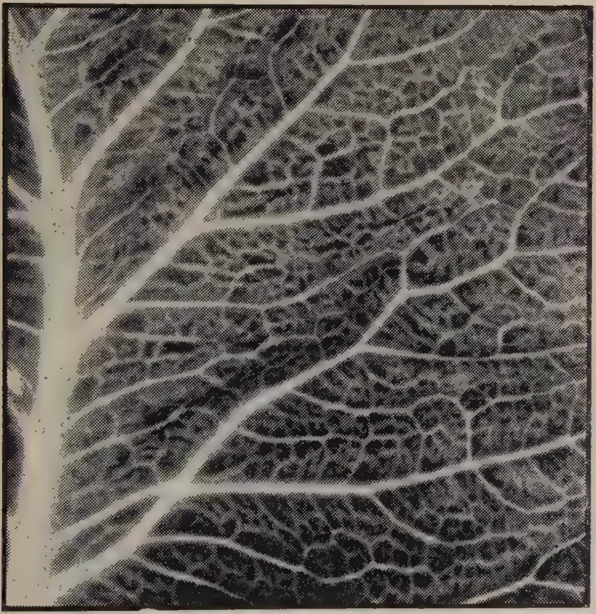
Cauliflower: Two to three weeks after infection young leaves develop a lightening in colour along the veins. This is termed vein clearing (Fig. 1). This may persist as leaves age, but is usually replaced by dark green bands of tissue next to the veins, termed vein banding (Figs. 2 and 3). In areas between the veins pale green spots, rings, or line patterns soon appear (Figs. 2 and 3). Portions of the leaf between the veins may later become yellowed (Fig. 2). On mature leaves dead spots or patches may develop on this yellowed tissue. Symptoms are often more pronounced on one half of a leaf, causing the blade to develop unevenly and become bent over to one side (Fig. 3).

Infected plants are usually stunted, especially when infected early in the season. Central leaves remain small and tend to be upright, leaving the heads exposed. The heads are often of poor shape and usually too small for marketing.

Cabbage: On spring cabbage the most common symptom is vein clearing. Leaves of savoy cabbage become mottled with blotchy areas of pale green or yellowish tissue. Plants often fail to develop hearts, the leaves then forming loose rosettes.

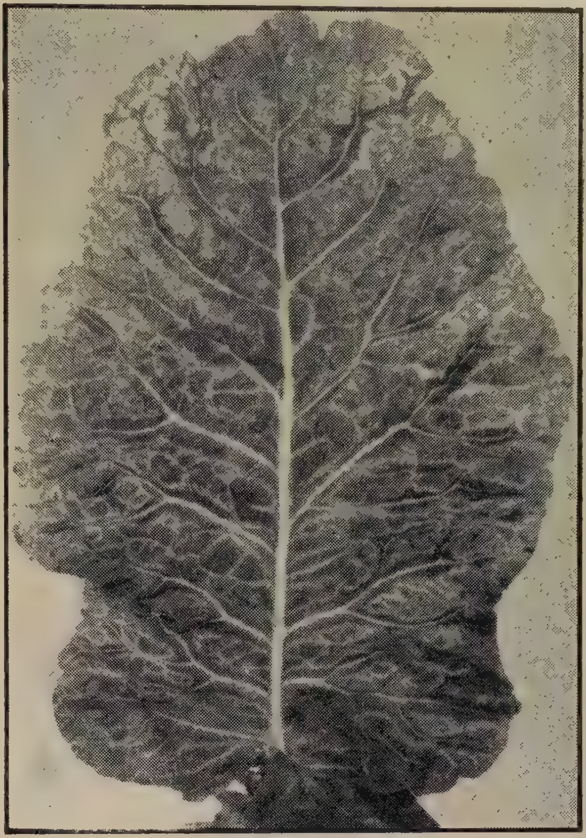
Chou moellier: Symptoms on fully grown plants are dark green vein banding with yellowish ring and line patterns between the veins.

Swede and rape: The first symptom to appear is a vein clearing of young leaves. As leaves age this is replaced by dark green vein banding, which may be confined to small areas of a leaf or develop over its whole surface. Infected plants are usually reduced in vigour.



[*Department of Scientific and Industrial Research photo.*

Fig. 1—Portion of cauliflower leaf showing vein clearing.



[*Department of Scientific and Industrial Research photo.*

Fig. 2—Cauliflower leaf showing vein banding, mottling of the leaf between the veins, rings, and line patterns.

Turnip: About 3 weeks after infection yellowish spots appear on young leaves. This may be followed by development of small dead patches along the fine veins. Later growth is stunted, leaves being small, savoyed, and twisted. When the outer leaves have fallen a small bunch of distorted leaves is left at the crown.

Chinese cabbage: Naturally infected plants have not been observed. Experimentally infected plants in the glasshouse develop yellow spots on leaves, which remain small and are often distorted.

Varietal Susceptibility

Varietal susceptibility trials are as follows:—

Cauliflower: Extensive trials in the United States of America (Tompkins, 1937) and England (Caldwell and Prentice, 1942) showed that all varieties tested in these countries were susceptible.

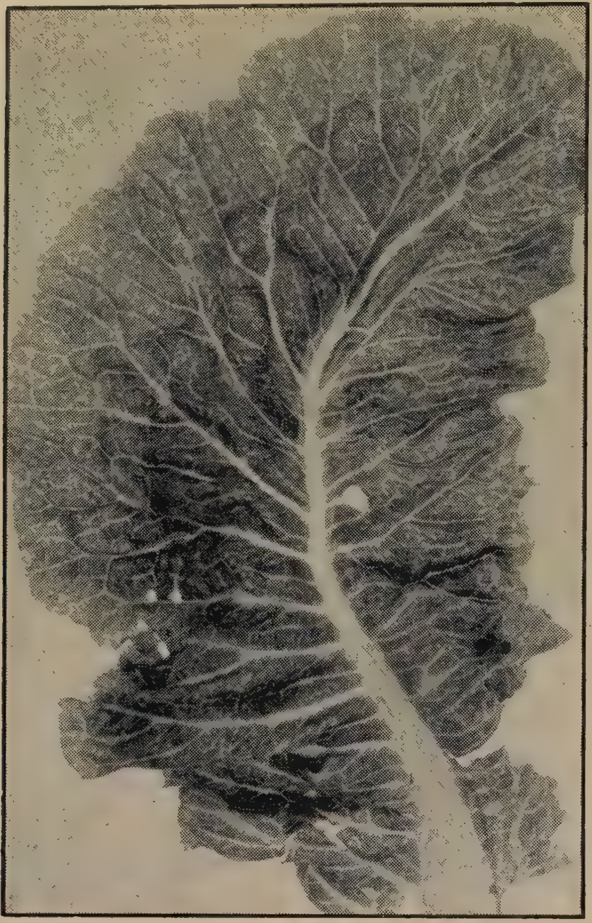
A field trial was carried out to ascertain the relative susceptibilities of the New Zealand-grown varieties Snowball, All Seasons, Phenomenal Maincrop, Early Maincrop, and Australian Five Month. Plants were inoculated 2 weeks after transplanting. All varieties developed typical symptoms with no differences in intensity.

Swede, turnip, and rape: The following varieties were grown in the glasshouse and plants inoculated when three leaves had developed.

Swede: Superlative, Grandmaster, Sensation, Calder.

Turnip: Green Resistant*, Green Top Yellow, Soft Green Top Yellow (now Victory Yellow), Purple Resistant*, Purple Top Yellow, Green Globe, Red Globe, Purple Globe, and White Stone.

* Club-root resistant varieties.



[Department of Scientific and Industrial Research photo.

Fig. 3—Cauliflower leaf showing vein banding, mottling, and bending to one side.

Rape: Broad Leaf Essex, Club Root Resistant, and two Giant selections.

All varieties became infected. There was no apparent difference in susceptibility.

Host Range

Host-range studies carried out in the United States of America (Tompkins, 1937) and England (Caldwell and Prentice, 1942) showed that many cultivated plants and weeds belonging to the plant family *Cruciferae* were susceptible to infection. Of these the following occur in New Zealand: Brussels sprouts, kohl rabi, kale, leaf mustard, black mustard, white mustard, yellow mustard, charlock, jointed charlock, radish, garden cress, annual stock, honesty, candy tuft, and shepherd's purse.

Methods of Transmission

The virus is transmitted experimentally by artificial inoculation, the leaf-rubbing technique being used.

In the field the disease is spread by aphides. Severin and Tompkins (1948) recorded transmission by three species of aphis which occur naturally on cauliflower and 11 species which do not. Of these vectors the mealy cabbage aphis (*Brevicoryne brassicae* Linn.), the false cabbage aphis (*Lipaphis erysimi* Kltd.), the green peach aphis (*Myzus persicae* Sulz.), the melon aphis (*Aphis gossypii* Glov.), and the lily aphis (*Aulacorthum circumflexum* Buckt.) occur in New Zealand, but only the first three naturally infest brassicas.

There is no evidence of seed transmission.

Identity

Cauliflower mosaic in New Zealand appears to be identical with that described in the United States of America by Tompkins (1937), since symptoms on cauliflower are the same and both viruses have a thermal inactivation point between 75 degrees and 80 degrees C.

Economic Importance

The disease has been found on cauliflower in Auckland, Hastings, Levin, New Plymouth, Wellington, Blenheim, and Lincoln. Amount of infection in affected crops is often high, with 30 per cent. or more of plants failing to develop marketable heads.

Infection has been noted on cabbage in Christchurch, on turnip in Otago, and on swede, rape, and chou moellier at Lincoln. Losses in these crops are difficult to assess in the absence of more extensive observations or trials.

Control

Infection is spread by several types of aphides which move about in a crop, transmitting the disease from plant to plant. Because of the difficulty in eradicating these insects, it is necessary to eliminate or avoid sources of infection such as weed hosts, old plants left for seed, or volunteer plants.

Field crops: Existing brassica crops may act as sources of infection for new crops. It is advisable therefore to sow seed for new crops as far as possible from those already established.

When a crop has been harvested or fed off the field should be ploughed immediately to ensure that all remaining plants are buried.

Market gardens: Seedling beds should be established as far as possible from existing brassica crops. Seed should be sown thinly, as crowded conditions favour a build-up of aphis infestation.

Many cruciferous weeds are susceptible and may act as sources of infection. Frequent removal of weeds from within the crop, from headlands, and from hedgerows or roadsides will assist in reducing the spread of infection.

Infected plants in the crop should be destroyed as soon as they are noticed, especially in the first half of the growing season. This will reduce spread of infection and will not result in any direct loss, as infected plants will be of little or no value by harvest time.

When harvesting is finished all remaining plants should be ploughed in immediately. It is unwise to save unharvested plants for seed, since, if infected, they act as a source of infection for nearby crops.

In districts where the disease is well established no brassica crops should be growing for at least a month each year. During this period attention should be given to the removal of weeds from the cropping area and its surroundings.

Literature Cited

Caldwell, J., and Prentice, I. W., 1942: "A Mosaic Disease of Broccoli". "Annals of Applied Biology", 29, pages 366 to 373.

Severin, H. A. P., and Tompkins, C. M., 1948: "Aphid Transmission of Cauliflower-mosaic Virus". "Hilgardia", 18, pages 389 to 404.

Tompkins, C. M., 1937: "A Transmissible Mosaic Disease of Cauliflower". "Journal of Agricultural Research", 55, page 33.

World Land Resources

THE papers contributed to the United Nations Scientific Conference on the Conservation and Utilization of Resources, held at New York in August and September 1949, have now been published and volume VI, "Land Resources" (630 pages), covers the following subjects: Soil conservation and soil fertility, aids to farming (mechanisation), plant breeding, crop production, storage and preservation, livestock breeding and feeding, livestock diseases, the improvement of grasslands, and land development.

Papers by New Zealanders included in the volume are: "Soil Survey in Relation to Soil Conservation" (L. I. Grange); "Development and Maintenance of Superior Genetic Stocks" (O. H. Frankel); "Some Research Aspects of Soil Conservation and the Future of the Hills" (E. B. Levy and F. E. T. Suckling); "Soil Fertility and Pasture Production: Legumes, Fertilizers and the Grazing Animal" (P. D. Sears); "The Breeding of Pasture Plants in New Zealand" (L. Corkill); "The Role of Grassland in Soil Conservation—Aerial Topdressing and Seeding Trials" (D. A. Campbell); and "Management of a Permanent Pastoral Industry to Guard against Grazing Land Deterioration" (E. B. Levy).

The papers published in the volume are of great importance and indicate problems as well as achievements in the conservation and utilisation of the land resources of the world. A copy of this volume can be obtained through the National Library Service, Wellington.

Colony Requirements during Honey Flow

Seasonal Notes for the Domestic Beekeeper

WITH summer comes the climax of the year for the domestic beekeeper. Work with his hives then may not be the most interesting of the year, but a certain amount of skill is required in managing his apiary to ensure best conditions for the bees to accumulate the honey crop. Work to be done during summer is discussed in this article by T. P. J. Williams, Apiary Instructor, Department of Agriculture, Hamilton.

IF hives have been correctly managed during spring, have not swarmed, and are headed by young, prolific queens, they will now have reached maximum strength and should be in a populous condition to take full advantage of the main honey flow, which usually begins in December.

Once the flow has begun the beekeeper must keep a careful watch to see that hives are provided with plenty of room for the storage of nectar. When nectar is brought in from the fields it is placed temporarily in cells of combs, including those in the brood nest, and is later removed to the supers above and the water is evaporated from it by the bees.

Supering

Though many beekeepers regard the super as a box of combs for the storage of surplus honey, it plays a very important part in the apiary, for it eliminates any congestion of the brood nest and allows the bees room to invert the nectar brought in.

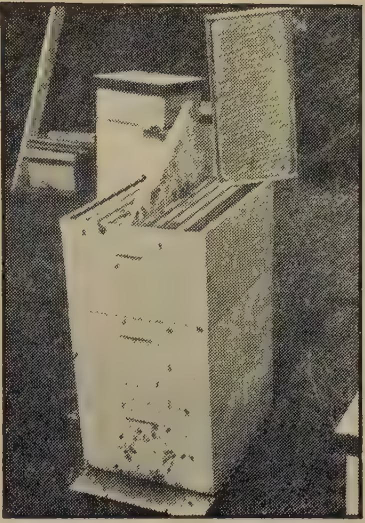
Supers should not, however, be added to the hive if nectar is not available, for this induces the queen to use the combs for brood rearing and the bees are inclined to store pollen in them. Moderate to strong colonies of bees will fully occupy at least two hive boxes in most localities at this time of year. The addition of a third super should be decided on according to the intensity of the honey flow and the strength of the hive. A good indication that the hive requires another super is when the bees begin to build out the frames along the top edges with new wax, giving them a fresh, white appearance. Before this super is added the hive should be rearranged so that there are seven or eight frames of brood in the bottom box and the remaining brood in the super above. If there are any frames of honey, they can be removed and placed in the middle of the new super and their place in the brood nest filled by good empty combs or, if these are not available, by frames fitted with full sheets of foundation wax. When the first super is put on it is best to fill it entirely or partially with drawn-out combs. If foundation wax only is used in the super, queen excluders should not be used, as the bees rarely travel through the excluders to work the foundation and will usually swarm. The bees may be induced to enter the super by placing in the middle of it a drawn comb which serves as a bait.

A fourth super should not be added until the third super is about three-quarters full of honey and has half the combs completely capped. Frames should be spaced evenly, eight to the super, as this enables the bees to build each comb beyond the width of the wooden frame and it is then easy to uncap the combs at honey-extracting time.

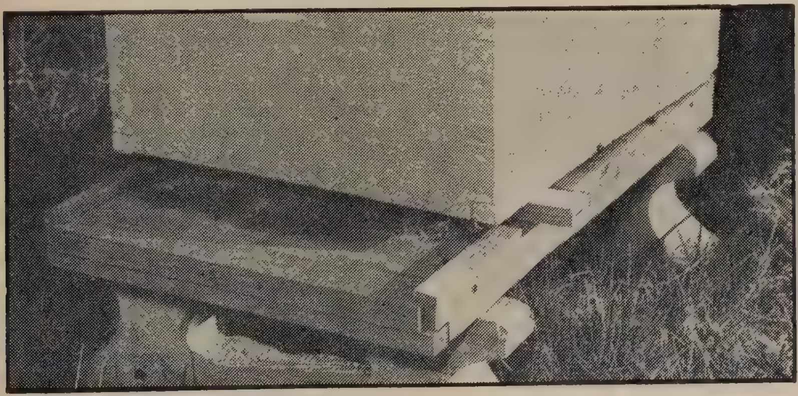
Some beekeepers may have been bothered during previous seasons by the bees joining the tops of the frames in the second box to the bottoms of the frames in the third box. The material that joins the supers is called burr comb. If a piece of cardboard the size of a saucer is placed between the supers on top of the frames in the second super, by the time the bees have gnawed it away they should have lost any desire to join the frames.

Securing Good Combs

It is necessary each year for the beekeeper to make provision for new combs, as these are needed the following spring for replacing combs containing too many drone cells or old, damaged combs. Summer is the ideal time to secure good combs by placing frames of foundation between drawn-out combs and leaving them with the colony for the storage of honey during the honey flow. They can then be extracted and stored away until required next spring.



Another super of combs should be added when the top super has the middle combs capped and the outside ones partly filled.



[*Commercial Studios photo.*

Use of wooden blocks between super and bottom board to increase ventilation at the entrance of a hive in summer.

Use of Queen Excluders

Queen excluders are often condemned as being a cause of swarming, but in most localities swarming usually ceases as soon as the main honey flow has begun. Excluders should not be used for general purposes until the bees are used to working in the supers and the honey flow is in full swing.

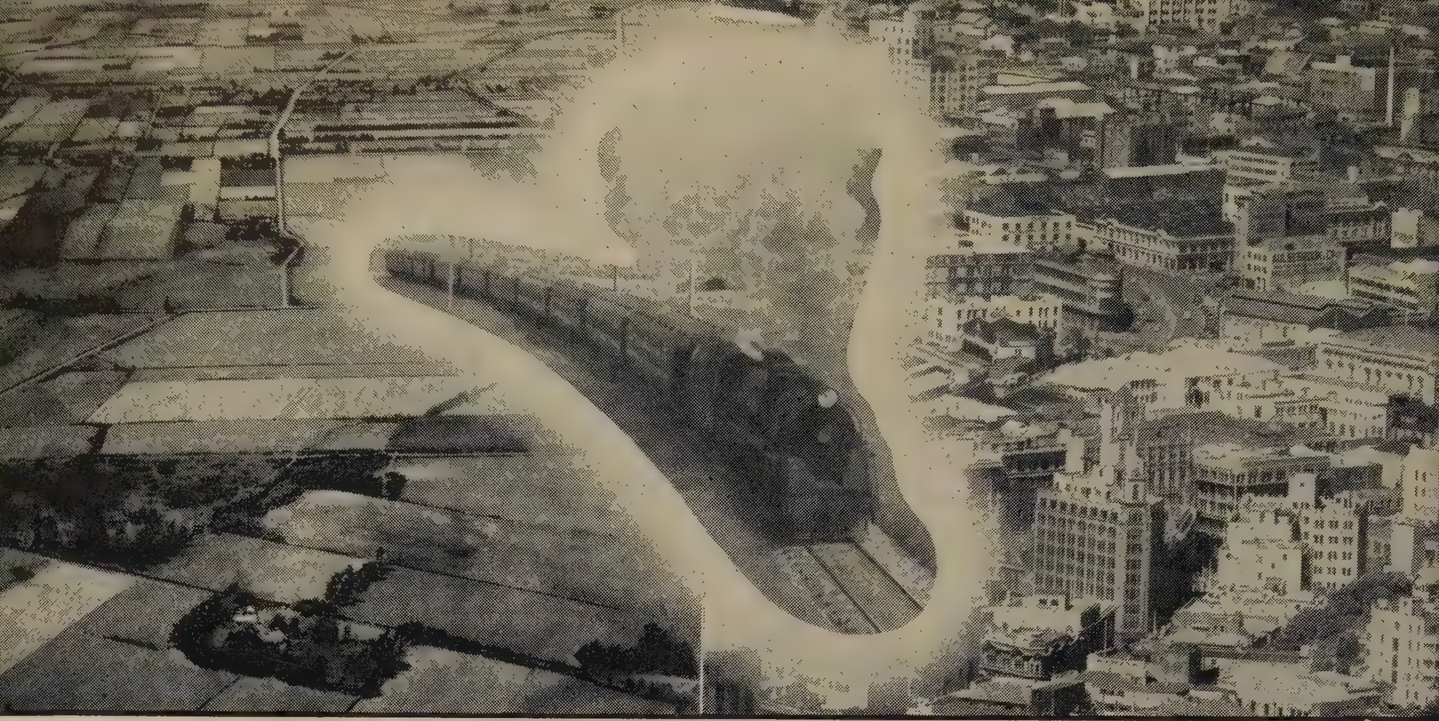
The advantages of the queen excluder are numerous. The queen is prevented from laying in the combs of the honey-storage super, the bees will store very little pollen above an excluder, and the crop may be removed without the destruction of any brood.

Ventilation

As the weather is hottest at about this time, the provision of ventilation should receive consideration. If during hot days there are a number of bees at the entrance to the hive busy fanning to create a draught or clustering outside, it may be taken as an indication that they require more ventilation. This can be remedied by giving extra space at the entrance. The front of the hive may be lifted and two small blocks of wood about 1in. thick placed at the two corners.

When bees are ripening honey the air inside the hive becomes saturated with moisture, and they have to circulate currents of air through the hive to remove it by fanning at the hive entrance. Under these conditions hive mats absorb moisture and becom quite wet, causing hive material t rot. This may be avoided by cuttin the mat so that about an inch of th frames at each end is not covere thus allowing the circulation of a in the hive to pass over the m keeping it dry.

◆◆



Population Movement from Country to Towns

THE country to town drift of population is not peculiar to New Zealand, but exists in many if not most countries. When population moves the reverse way exceptional conditions such as famine, war, or pestilence usually prevail. Some basic reasons for migration from rural to urban areas are discussed in this article by D. A. Viggers, Rural Sociologist, Department of Agriculture, Wellington.

UP to 1906 the population in counties in New Zealand exceeded that in boroughs and cities. In 1911 they were almost equal. Ten years later boroughs and cities held 56 per cent. and by 1945, 63 per cent. of the population. For a country so dependent on agriculture this proportion seems very high. Only brief reference is made to the reasons for the urban population being so high. Attention, however, is directed to the continuing phenomenon of country to town migration.

Common to most, if not all, migrations is a smaller flow the reverse way. In the United States the volume of the reverse movement is considerable (1). In New Zealand little knowledge exists on this, though some evidence suggests that many women return to rural areas to marry.

Differential Birth-rates

One cause for the country to town migration is attributed to the difference between town and country birth-rates. The difference between these birth-rates can be understood from the graph on the opposite page, which shows the birth-rates for 30 years for urban areas and for all New Zealand. Urban area includes both the central borough and all adjoining or neighbouring suburbs (2). These are the same for all years shown. They cover Auckland, Wellington, Christchurch, Dunedin, Hamilton, Gisborne, Napier, Hastings, New Plymouth, Wanganui, Palmerston North, Nelson, Timaru, and Invercargill.

As the period covered by the graph includes the depression of the 1930's, the Second World War, and the years of full employment since, it represents a wide range of conditions. Throughout this period, except for 1943 and 1944, the New Zealand rate is higher than that for urban areas, but as the New Zealand rate includes urban areas, the rate for that portion of New Zealand outside urban areas (largely rural) must be still higher. With other statistics this may be traced further back, yet its persistency over the past 30 years indicates its permanence.

There is not an abrupt break in the birth-rates between town and country, but from open country through small towns to the largest cities, the birth-rate tends to fall. Support for this is available from census data. Children under 5 years at the census must have been born in the preceding 5 years of women who would overwhelmingly be in the group married women over 16 and under 45 at the time of the census. Consequently the number of children under 5 for every 100 married women over 16 and under 45 affords a comparative indication of the birth-rate between different towns or areas. This is shown in Table 1 for the 1936 and 1945 censuses, with basic statistics for the latter.

TABLE 1—INDEX OF BIRTH-RATES BETWEEN VARYING SIZES OF TOWNS AND OPEN COUNTRY FOR 1936 AND 1945 CENSUSES

	Children under 5 per 100 married women between 16 and 45		Average size of town	Children under 5	Married women 16 to 45
	1936	1945	1945	1945	1945
Four chief urban areas	56	67	165,887	59,398	89,138
Smaller urban areas ..	67	75	21,822	20,989	28,169
Other boroughs	71	78	2,320	22,191	28,533
Other town districts ..	72	83	634	3,430	4,116
Open country	80	92	—	56,038	61,206

In 1945 in the four largest urban areas there were only 67 children under 5 for every 100 married women between 16 and 45, whereas in open country there were as many as 92 children for every 100 married women, with the proportion in smaller towns in between rising as the population of towns became smaller. For both censuses the numbers of children per 100 married women was lowest for the four largest urban areas and rose gradually to open country. The indices are lower for 1936 than for 1945, because as the graph on the opposite page shows, the birth-rate for New Zealand was low in the former year and much higher in the latter. Thus with a high or low national birth-rate level there is a marked gradation in the birth-rates upward from large towns through small towns to open country.

Openings for Employment

The significance of this as one cause of migration from rural to urban areas is important. These indices suggest that for every generation of people gainfully employed the numbers in the succeeding generation available for gainful employment are relatively greatest in open country, but decrease through small towns to the largest cities. Thus

---

Photographs in heading illustration by V. C. Browne (left), New Zealand Railways (middle), and "Evening Post" (right).

young people entering gainful employment in the larger cities will have better opportunities of securing positions than will those in smaller towns, and prospects for the latter will be better than for those in open country. When such inequalities exist people seeking work will move from towns or areas of less opportunity to those with greater, and this inevitably brings a population movement from the country through small towns to the larger towns.

[*J. D. Pascoe photo.*

Mountain ranges, lakes, and rugged bush country form the larger part of the one third of New Zealand which is unfit for settlement. The illustration shows the inaccessible headwaters of the Tauherenikau River, which lie under Mount Hector in the Tararua Ranges between the prosperous Manawatu and Wairarapa districts.

Scarcity of Land

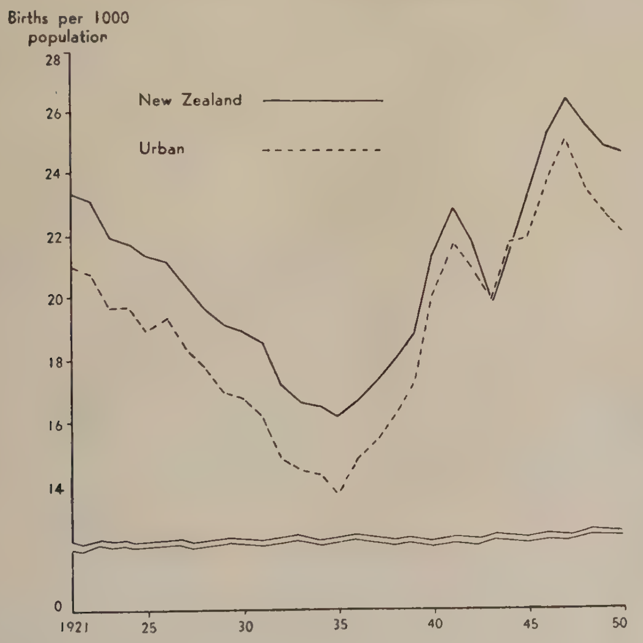
The increasing scarcity of farming land is also a cause of shift to towns and cities. The area of New Zealand is 66,390,000 acres, of which 43,254,000 acres outside borough boundaries was occupied in 1950. The remainder of approximately 23,000,000 acres consists largely of land unfit for settlement; it includes also rivers, lakes, roads, areas within boroughs and cities, an area of native land, and a small area represented by holdings of under 1 acre outside boroughs. Any rapid or material increase in farming lands from these areas can be disregarded.

The areas of occupied farming lands at 5-year intervals since 1920 are shown in Table 2.

TABLE 2—OCCUPIED LAND

	Unimproved occupied Acres (thousands)	Improved occupied Acres (thousands)	Total occupied Acres (thousands)
1920 ..	25,468	18,005	43,473
1925 ..	25,121	18,511	43,632
1930 ..	24,213	19,156	43,369
1935 ..	23,602	19,503	43,105
1940 ..	23,269	19,659	42,928
1945 ..	23,274	19,732	43,006
1950 ..	23,025	20,229	43,254

Up to 1920 the total occupied area increased gradually, but for the last 30 years the total has remained almost constant at about 43,000,000 acres. This constancy indicates that efforts to locate new and suitable lands for farming have been very unfruitful. Clearly the area of land left in New Zealand for agricultural settlement is, under present agricultural management practice and social standards, very small.



New Zealand and Urban Areas Birth-rates, 1921-1950

Unimproved Land

The rate of conversion of unimproved land to improved land has varied over the past 30 years, but on average it represents only a net 4 acres annually for every 1000 acres improved. Opportunities for converting unimproved land to improved are becoming fewer and the work more difficult. Table 3 demonstrates this.

TABLE 3—AVERAGE AREA OF VIRGIN LAND SOWN TO GRASS ANNUALLY

	Acres (thousands)
1920-24	216
1925-29	174
1930-34	109
1935-39	74
1940-44	59
1945-49	40

The rapid decrease in areas of virgin land sown to grass implies that difficulties are being met in winning new land and that the area of improved land is very close to its limit under present managerial practice and prevailing economic and social standards.

The 23,000,000 acres of unimproved occupied lands in 1950 were of the following types:—

	Acres (thousands)
Tussock and naturally established danthonia	12,929
Phormium tenax (N.Z. flax) ..	46
Fern, scrub, and second growth	5,224
Standing native bush or forest	2,934
Barren and unproductive ..	1,892
Total	23,025

The naturally established danthonia and tussock country is largely terrain for high or hill sheep-country farming, as the country is usually so rugged that it cannot be farmed by other than extensive grazing methods. Very often the rigour of the winter climate also affects carrying capacity and necessitates the country being managed in large areas to include winter grazing. The extent to which bush lands which have been cleared and sown to grass have subsequently reverted to second growth is well known. The standing native bush will be largely in areas too rugged for farming or where reversion is difficult to resist.

Suitable Land Mostly Occupied

The inevitable conclusion seems to be that New Zealand is close to the limit of its agricultural land under present techniques. As new techniques develop, particular local problems are solved, or small local opportunities are

DOUBLE TRIUMPH for

ELASTRATOR CASTRATION AND TAILING

at the Marlborough A. & P. Association, Picton

1st PRIZE on the hoof

. . . to Mr. M. D. Campbell, Marlborough, enthusiastic Elastrator user for 4 seasons. He finds Elastrator rubber ring method easy, clean, safe . . . has operated on more than 1,200 lambs and lost only ONE. Says Elastrator gives first-class results . . . proves it with champion stock.

1st PRIZE on the hooks

. . . to Mr. T. P. Murphy of Spring Creek, another consistent Elastrator user who acclaims the advantages of the bloodless method of castration and tailing . . . and who shares in Elastrator's Double triumph.

Follow their lead. Next season, for better stock, use the

ELASTRATOR

Bloodless Rubber Ring Method of Castration and Tailing

Elastrator Co. Ltd., Box 266, Blenheim.

ISSUED BY THE NEW ZEALAND DEPARTMENT OF HEALTH

HYDATIDS is Dangerous

It is up to YOU to protect yourself and others from this dread disease

Dogs carry *Hydatid tapeworms*, but do not grow the cysts like human beings, and stock animals. In their droppings, they scatter the *Hydatid tapeworm* eggs from which grow these dangerous cysts. As dust, the eggs are blown on to stock pastures, or adhere to the coats of dogs, and so reach human hands. The disease can be stopped by these precautions:

1. After handling animals, never put hand to mouth without washing. Make sure children wash hands before eating.
2. Wash carefully, all vegetables and fruit eaten raw. They, too, can harbour the tiny tapeworm eggs.
3. Never throw raw liver or lungs of sheep to dogs. Cut offal into slices and boil first. Otherwise, burn or bury it. It is here that dogs become infected.

DOSE YOUR DOG WITH A VERMIFUGE EVERY THREE MONTHS

Arecoline is supplied for this purpose. It can be obtained with your dog license.

EXPEL THE WORMS NOW.

Dose your dogs regularly. Never feed them on raw offal.

11.2a

---

the wise farmer—
lengthens the working time of his tractor
by insisting on SHELL

World-wide research by Shell has produced highly efficient fuels and oils for all types of tractors. Lengthen the working time of your tractor and be sure of utmost power by insisting on the Shell fuel to suit your particular type.

SHELL DIESOLINE
CROSS POWER KEROSINE
SHELL MOTOR SPIRIT

THE SHELL COMPANY OF NEW ZEALAND LIMITED
(INCORPORATED IN ENGLAND)

Shell Tractor Log Books and Tractor Servicing Sheets are available for most makes of tractors. If you have not already got yours, write to your nearest Shell Branch.

BE SURE—INSIST ON SHELL

TF1·2A

realised, the area of both total occupied and improved lands will increase, but at so slow a rate as to be negligible.

Against a constant area of farming lands must be placed the growing population. These are compared in Table 4.

TABLE 4—COMPARISON OF OCCUPIED FARMING LANDS AND TOTAL POPULATION

	Total population (including Maoris)	Total occupied area Acres (thousands)
1920 ..	1,236,915	43,473
1925 ..	1,379,487	43,632
1930 ..	1,489,203	43,369
1935 ..	1,560,992	43,105
1940 ..	1,640,901	42,928
1945 ..	1,679,972	43,006
1950 ..	1,914,120	43,254

Stability in Rural Population

Between 1920 and 1950 the population of New Zealand increased by 677,205 or 55 per cent., yet the area of farming lands remained almost constant at about 43,000,000 acres. As New Zealand is so dependent on farming for its welfare, this provides another demonstration of the scarcity of land. Within the present agricultural techniques this 43,000,000 acres can find employment or support for only a fairly constant farm population. As there is a limit to the numbers of people that one farm can support, so, taking all farms together, there must be a limit to the total farm population.

As agricultural techniques improve it may be that, while the rural standard of living is maintained or improved, more farming folk will be needed, but any such increase will probably be slow, because discovery and application of new techniques are seldom rapid. Stability in farming population seems inevitable. In Table 5 are shown the numbers of people engaged in farming at the various census dates.

TABLE 5—PEOPLE ENGAGED IN FARMING

Census	Males	Females	Total
1921 ..	122,980	9,098	132,078
1926 ..	116,953	3,396	120,349
1936 ..	144,456	6,357	150,813
1945 ..	108,873	10,134	119,007

In 1921 a recession and in 1936 the effects of the depression of the 1930's would tend to increase the farm population, because of unemployed returning to rural homes. In 1945 numbers would be low because of males still serving in the armed forces. When allowances are made for these the farm labour population is surprisingly constant; as the number of dependants to each worker will be fairly constant, the total farm population will also be constant.

The New Zealand population has been increasing and the greater portion of the increase is from the excess of births over deaths. As it is also known that the birth-rate in rural areas is higher than in towns, it follows that the rural population is more than replacing itself; but as there is a limit to the number the land can support, the people in excess of those required for maintaining the farm population must seek non-farm occupations, and most of these by finding an urban occupation join the country to town migration.

Maori Population

With the exception of Table 4 no reference has been made to the Maori population. It is predominantly rural, but because of the Maoris' gradual adoption of European ways and their rapidly increasing numbers, it is pertinent to inquire if there has been any measurable displacement between Maori and non-Maori sectors of the farm labour force. The summary of Maori occupations shown in Table 6 suggests that the growing Maori population is numerically not advancing rapidly in farming occupations.

TABLE 6—SUMMARY OF OCCUPATIONS OF MALE MAORIS ENGAGED IN GAINFUL OCCUPATIONS

	1926	1936	1945
Agricultural and pastoral ..	6,710	8,274	8,062
Ill-defined ..	6,042	9,079	6,860
Other	4,662	4,323	8,210
Total	17,414	21,676	23,132

Statistics of occupations of Maoris are not available for the 1921 census. For later censuses, because of smaller questionnaires for Maoris, statistics of occupations of Maoris are not as complete as those for non-Maoris. Thus arises the large group "Ill-defined", in which the greater proportion (85 per cent. in 1945) are described as labourers who may belong to any one of several industries, but very probably a high but unknown proportion are occupied in farming. The largest industries under "Other" were building, construction and maintenance of roads, transport and communication, freezing works and dairy factories, and forestry.

The high numbers for farming and "Ill-defined" and low numbers for "Other" in 1936 appear to reflect the effects of the depression. The outstanding rise in "Other" occupations in 1945, even though assisted by the

BELOW: A third of the total area of New Zealand is devoted to extensive farming. It is mainly hill country (including tussock land) which, because of low carrying capacity or severity of climate must be managed in large areas. The illustration shows a shepherd on a Canterbury high-country run making his daily round during lambing as the last of the winter snow clings to the lower ranges. National Publicity Studios photo.

HEALTHY BIRDS
MUST HAVE

Vitamin A

VITAMIN A
MEANS

MORE EGGS

£ £ £ BIGGER PROFITS

HEALTHY BIRDS

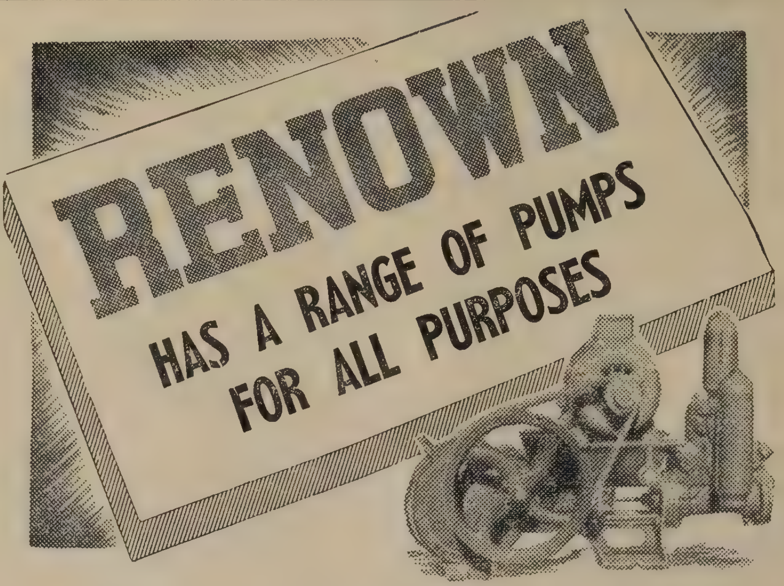
Costs only
ONE PENNY per day
for 30 birds-

A test over a period of 11 months carried out by the Department of Agriculture with Laying Pullets **proved conclusively** that the addition of a Fish Liver Oil containing Vitamins A and D results in **increased egg production,** which, in terms of cold **profit,** amply justifies the slight additional cost and trouble.

"Poultrol" Poultry Feeding Oil has a guaranteed Vitamin potency of 2,000 Vitamin A and 200 Vitamin D International Units per gram. At feeding levels recommended by the Department of Agriculture, **"Poultrol" costs only 3½d. per day per 100 birds!**

"Poultrol" is available as an Oil or in Emulsion form for Wet Mash feeding.
Manufactured in New Zealand for William H. Terry & Co. Ltd., Atlas Building, Ghuznee Street, Wellington. **Available from Distributors everywhere.**

POULTROL
DOUBLE STRENGTH
POULTRY FEEDING OIL



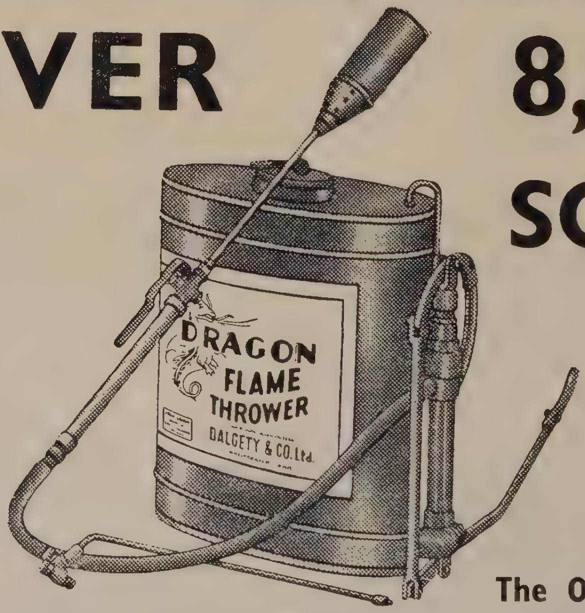
In a Renown Pump you have the product of a firm associated with Pump manufacturing since 1879, and whose staff and organisation is keyed to give the best of this long experience. Expert installation advice and service is always available.

See the latest Renown Pumps at your nearest merchant dealers.

or write direct for FREE printed matter.

W. H. PRICE & SON LTD.
34-36 Manchester Street, Christchurch. P.O. Box 1084. Established 1879.

OVER 8,000 SOLD



The Outstanding
"DRAGON" FLAMETHROWER and HIGH Pressure SPRAYER
FOR ALL BURNING AND SPRAYING JOBS

Enquire from
DALGETY & Co. Ltd.
ALL BRANCHES

impetus of the Second World War, suggests that the Maori now tends increasingly to seek avenues of employment other than farming. Thus the increase in Maori population is not necessarily yet reflected greatly in farming occupations.

A comparison of non-Maori and Maori male farm workers is provided in Table 7.

TABLE 7—COMPARISON OF MAORI AND NON-MAORI MALE FARM WORKERS

Census	Non-Maori	Maori	Maori per 100 non-Maori
1926 ..	116,953	6,710	5.7
1936 ..	144,456	8,274	5.7
1945 ..	108,873	8,062	7.4

Although this table must be accepted with some reserve, because of the probable understatement of Maoris, the constancy of the 5.7 Maoris per 100 non-Maori workers for 1926 and 1936 has some force.

The rise to 7.4 for 1945 may not be indicative of a basic change in proportions as much as a reflection of war conditions. Even if the ratios are arbitrarily increased by half to 8.5 and 11.1 Maoris per 100 non-Maori farm workers to allow for the understatement of Maoris, these still indicate that Maori farm labour is but a small part of the total farm labour force.

For New Zealand as a whole there appears to have been no measurable displacement between Maori and non-Maori sections, so that the conclusion from Table 5 of a relatively stable non-Maori farm population remains unaffected.

Science and Invention

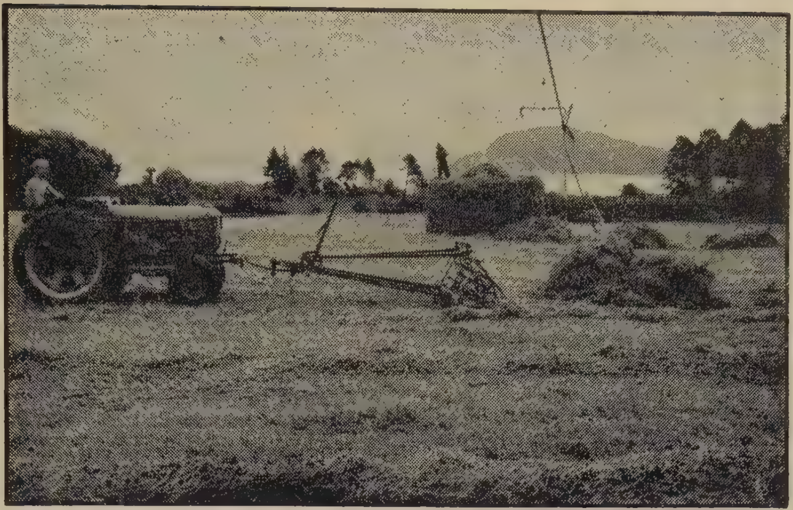
Science and invention are indirectly a cause of migration from rural to urban areas in at least two ways. One arises from new services and products. The demand for industrial products is almost limitless compared with that for agricultural products. For such goods as radios, vacuum cleaners, refrigerators, the many home electrical appliances, and motor-cars with all their related services, and for such services as transport facilities, represented by trains and aeroplanes with their supporting organisation of men and materials, there is, compared with food, an almost limitless demand.

Individuals cannot eat more than a daily ration, but there is almost a limitless list of industrial products they desire and strive to obtain. Thus as man's ingenuity develops new services and goods, a demand arises for them and labour is required to provide the services or goods. These are usually manufactured in towns, and so a demand for labour arises in towns, and to equalise the demand between town and country, labour will move to towns.

The second way in which science and invention have affected country to town migration is in the manner in which they have enabled agriculture to produce more with less human effort. The statistics in Table 8 indicate how the three most important items of New Zealand agriculture have increased in volume in the past quarter century.

Increased Efficiency

Production, in general terms, doubled over the period 1925 to 1950, but the area of farming land did not alter materially.



Above and below—A contrast in methods. Mechanisation (above) not only reduces the need for men, but does the work more quickly. The increase in number of agricultural tractors in New Zealand from 3891 in 1930 to 40,310 in 1951 is one indication of recent advances in mechanisation.

[*National Publicity Studios photo.*

TABLE 8—BUTTERFAT, WOOL, AND LAMB, 1925-50

	Butterfat produced (3) lb. (millions)*	Wool exported lb. (millions)†	Lambs killed for export (4) Carcasses (thousands)‡
1925 ..	241.0	205.7	4,750
1930 ..	314.1	197.2	6,926
1935 ..	409.9	222.7	8,839
1940 ..	436.5	300.3	10,387
1945 ..	430.5	166.0	10,674
1950 ..	472.1	394.0	12,264

* Years ended June.
† Years ended December.
‡ Years ended September.

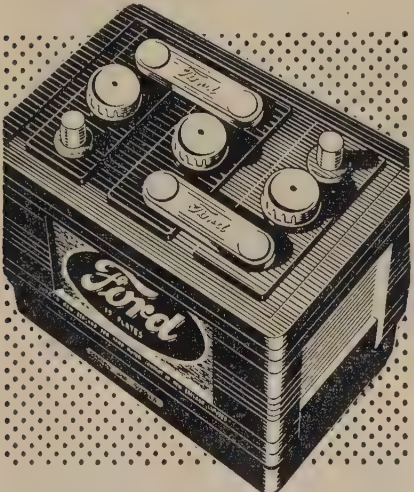
The use of Certified grass seeds, the growth in use of artificial fertilisers, improved production of dairy stock, the increase in the use of milking machines, and the introduction of tractors with their many attachments, particularly for harvesting, are all examples of how science and invention have helped to increase production on virtually the same area.

As the fluctuations in the farm labour force are small compared with the increase in production, the productivity of farm labour has increased. How long this increase can continue depends on the progress in science and invention. Since the days of at least Charles Townshend (1674-1738), who developed rotational farming, and of Robert Bakewell (1725-1795), who improved livestock breeding, science and invention have benefited agriculture in many ways, and it can be assumed that agriculture will continue to increase in efficiency.

Increased efficiency in agriculture gives increased production, but if the production is to be absorbed there must be consumers, and these will usually be found as an increased urban population. Thus the increasing efficiency of agriculture permits a larger urban population. It is even conceivable that in some cases increased efficiency would reduce the demand for farm labour, as for example with header harvesters, automatic pick-up balers, and milking machines. In reverse, to meet the demand for farm machinery and equipment, for fertilisers, and for services to create physical efficiency

Whatever you drive you need the POWER PLUS! battery

The battery is the heart of your car. Fit Ford for Power Plus! Five types for all makes at your Ford Dealers, or at leading garages and service stations.



5 types
for ALL MAKES

9-plates to 15-plates.
Replace with a

Ford BATTERY

Ford Motor Company of New Zealand
Limited Lower Hutt.

70.9

Progressive Farmers
know that they
can count on
helpful banking service
from

THE NATIONAL BANK
OF NEW ZEALAND
LIMITED

ESTABLISHED 1872

Free YOUR dairy herd of MASTITIS (Mammitis) with

VETSPEN CERATE

Penicillin UDDER INJECTION

'Penicillin' has become a magic name in relation to disease. In the realm of human healing the name 'GLAXO' has come to mean all that's progressive in penicillin research and development. The same progress has given the dairy farmer VETSPEN CERATE, the Glaxo PENICILLIN Udder Injection for the control of Mastitis (Mammitis).

Handy flat tins of 1 dozen tubes, date-stamped for guaranteed freshness and containing full directions for use, are available throughout New Zealand and cost only 12/-. Each convenient one-squeeze tube of Vetspen Cerate, now prepared from *procaine penicillin* for more prolonged action, provides the full recommended dose of 25,000 units of penicillin.

For more intensive applications, ask for Vetspen Cerate '50' (providing 50,000 units of penicillin), or if necessary, Vetspen Cerate '100' (providing 100,000 units of penicillin). Vetspen Cerate, in all these potencies, is available throughout New Zealand.

For the occasional very resistant case, Glaxo have produced Dihydro-Streptomycin Veterinary Cerate, available from chemists on veterinary prescription.

INSIST ON VETSPEN CERATE . . . product of GLAXO PENICILLIN RESEARCH
GLAXO LABORATORIES (N.Z.) LIMITED, Palmerston North

goods and services must be provided and this will often be done by an urban population.

International Relationships

Large overseas trade reacts on the proportions of rural and urban population within a country having such trade. If agricultural countries are the farming areas for industrial countries, it would be natural to expect them to have a high proportion of rural population, but for industrial countries to have a higher proportion of urban residents.

However, the situation is not quite so clear. New countries had a very high proportion of rural population, but as they aged trading and financial institutions arose to handle agricultural goods for export and industrial goods as imports, factories were needed to process agricultural products, and further factories were built for bulky and weighty goods not able to bear the costs of sea transport, so that gradually an urban population grew which in time developed services that dense populations seek and need.

In most countries there are doubtless numerous non-economic but social reasons for fostering industry or agriculture. National consciousness may give rise to various influences and of these the desire for self-sufficiency has been one. An outstanding example is that of industrial countries fostering agriculture to ensure an adequate food supply in the event of war. Non- or under-industrialised countries have fostered industry by the imposition of protective tariffs. Fostering of agriculture or industry will naturally tend to increase or retain the labour force engaged in them and thus tend to build up a rural or urban population accordingly.

Population Movements between Countries

Movements of population between countries may also be of consequence. The introduction of overseas immigrants into urban areas may tend to reduce migration from rural to urban areas within a country. In times of unemployment urban people may migrate in larger numbers to other countries and, if they do not return, then in a succeeding period of improved employment conditions the country to town migration may be unduly stimulated.

Though international relationships should not be disregarded in seeking to understand the rural-urban population structure of a country, these relationships are not simple. If the consequences of domestic policies are difficult enough to assess, the collective consequences of the policies of other countries on a single country are infinitely more complicated.

Apart from policies of man-made origin, the remoteness of New Zealand from industrialised countries and world markets has, possibly through the problems of transport and costs, assisted, compelled, or enabled a large urban population to be built.

Volume of Migration

The volume of movement from rural to urban areas varies considerably from time to time. It appears to depend very largely on prevailing economic conditions. In periods of full employment the movement tends to increase, but it recedes in periods of unemployment. An indication of the rise and fall of this migration for 30 years up to 1951 is shown in Table 9.

TABLE 9—AVERAGE ANNUAL POPULATION INCREASE IN COUNTIES AND BOROUGHS*

Date (1)	Population Counties (2)	Population Boroughs (3)	Period (4)	Years in period (5)	Increase for period Counties (6)	Increase for period Boroughs (7)	Increase per year Counties (8)	Increase per year Boroughs (9)
1921† ..	530,852	681,988						
1926† ..	551,457	785,040	1921-26	5.01	20,605	103,052	4,113	20,569
1936‡ ..	601,343	884,282	1926-36	9.93	49,886	99,242	5,023	9,994
1946† ..	610,990	1,047,270	1936-46	10.02	9,647	162,988	963	16,267
1951† ..	652,613	1,164,016	1946-51	5.05	41,623	116,746	8,242	23,118

* Excluding Maoris. † April. ‡ March.

Except for 1946 all statistics are from the various censuses. As the absence overseas of servicemen at the 1945 census possibly distorted the position, the population estimates for 1 April 1946 have been used. Counties include town districts.

The basic figures are shown in columns 2, 3, and 5. The increases shown in columns 6 and 7 are obtained from columns 2 and 3. The annual increases in columns 8 and 9 are obtained by dividing columns 6 and 7 by column 5. The increase for New Zealand consists of the excess of births over deaths and of immigration over emigration. Between 1921 and 1951 for every increase of 100 due to an excess of births over deaths there were about 20 due to an excess of immigration over emigration, so that the effect of overseas migration on population increase can be ignored. These comments apply to the increase in counties and in boroughs, to which is added the complication of migration from rural to urban areas.

If there were no country to town movement, it would be reasonable to expect that as the rural birth-rate is higher than the urban birth-rate, counties would show a greater percentage increase in population gains than boroughs. Between 1921 and 1951 counties increased by only 23 per cent., but boroughs by 71 per cent.; the migration to urban areas must affect the population increase in boroughs and counties.

Variations in Movement

Between 1921 and 1926 there was relatively little unemployment and the large increase in population of boroughs compared with that of counties suggests a vigorous movement townward. The years 1926 to 1936 include the depression years of unemployment, when the rate of increase in boroughs receded. The next period includes the war, when opportunities for employment were adequate, and the increase in borough population suggests a revival of the movement from rural to urban areas. In the post-war period of full employment the greatest average annual numerical increase in borough populations is recorded.

The post-war period, however, suggests a smaller proportional movement from country to town than that between 1921 and 1926. But for the low level of births in the late 1920's and early 1930's the migration would probably have been larger. From 1892 until 1920 the numbers of births increased in most years. From 1920 the numbers of births decreased, with variations, to a low level in 1935, when the number almost equalled that of 1905. If the number of births toward the close of the First World War had held throughout the 1920's and early 1930's, country to town migration probably would be greater today, but labour scarcity in both rural and urban areas would not be so acute.

Although other factors, notably the location of immigrants, affect the increases shown in Table 9, the figures should reflect approximately the trends in migration from rural to urban areas.

Selection

Previous discussion has directed attention to social and demographic forces that cause migration from rural to urban areas.

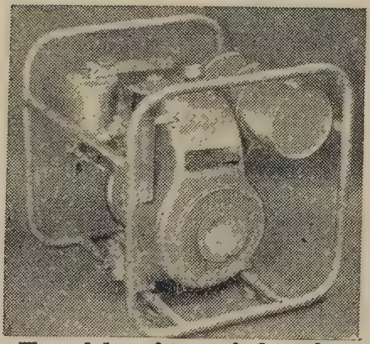
It is frequently contended that reasons such as a desire for city life induce individuals to migrate from rural to urban areas, but these are reasons for selection, not causes of the migration. The next question to be discussed is which people migrate, rather than why they do so. Three major classes of people enter the migration.

Increasing scarcity of land suggests that one group contains those who have little economic opportunity in rural areas. Many farms pass from one generation to another. Second and younger sons in farm families where the farm is too small to subdivide must seek a livelihood elsewhere, as must the sons of those in rural areas who are not farm owners. Some will seek occupations on farms or in the relatively few non-farm rural occupations, but many will go to urban areas. Girls, for whom little gainful employment exists in rural areas, will have little choice but to seek an urban occupation. Many probably return to become farmers' wives. Males, however, who leave because of a relative lack of opportunity, must also take wives with them to, or seek them in, urban areas.

With the second group who enter the urban migration age is a major basis. With the third it is sex. The consequences of these can be seen in the graph on page 519, which shows for three censuses, for males and females separately, the percentage distribution by ages of the population up to 65 in counties compared with that in boroughs and cities.

The dotted area indicates where the greater proportions of age groups are in rural areas, the shading where the proportions are greater in urban areas. Differences in the longevity of rural and urban populations will affect the respective proportions. As death-rates are higher for urban areas than for rural, a natural expectation would be that urban population would show a greater proportion in the younger age groups and a smaller proportion in the higher age groups than rural population. However the graph shows the

FIRE!



Tackle it with the modern, portable fire-fighting unit.

HALE

The Hale Portable Fire-fighting Unit weighs only 220 lbs., and can be easily and rapidly transported by two men. For fighting grass, gorse and other fires around the farm, a Hale on a truck with water tanks is the economical answer to fire-fighting and an efficient two-man fire brigade.

Powered by a Briggs & Stratton petrol engine . . . special exhaust primer for quick priming . . . 150 gallons of water per minute . . . canvas fire hose, branch pipes, fog nozzles, and suction hose also available. Please write or call for fullest details.

When Your Hale is Not Fire-fighting Use It For:—

- Irrigation
- Draining
- Sprinklers
- Emergency Water Supply
- Relaying water to a larger pump.

Brown Bros.
ENGINEERS LTD.

Pumping Machinery Specialists since 1908.
590 COLOMBO STREET, P.O. BOX 548J,
CHRISTCHURCH.

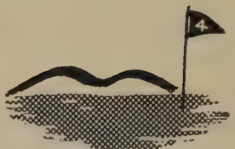
WOULD YOU LIKE A FREE COPY of

"DAVIS DAINTY DISHES"?

Cut out this advertisement and send with your name and address and 2d. stamp for postage to —

DAVIS GELATINE (N.Z.) LTD.,
Woolston, Christchurch.

GRUBNOX



gives more effective control of grass grub and Porina caterpillar because it is an ultra-fine powder

GRUBNOX 50 is very highly concentrated — it contains 50% DDT active principal (para para isomer).

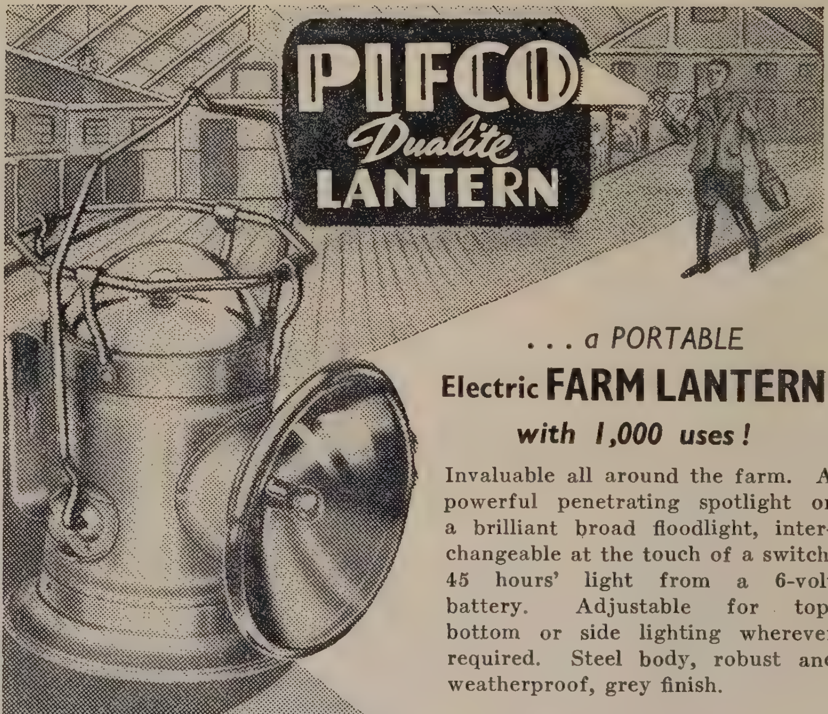
It is micronized by an exclusive process which produces an extremely fine powder, ensuring greater coverage and better contact with grubs and caterpillars. Compare fineness of GRUBNOX with other products and you will be convinced. On Pastures GRUBNOX can give up to three years protection.

Follow carefully advice of Research Centres and Department of Agriculture in combating Grass Grub and Porina Caterpillar.

FRUITGROWERS CHEMICAL CO. LTD.
PORT MAPUA NELSON

FRUITGROWERS CHEMICAL CO. LTD. MICROFINE

G5294.9



. . . a PORTABLE

Electric FARM LANTERN

with 1,000 uses!

Invaluable all around the farm. A powerful penetrating spotlight or a brilliant broad floodlight, interchangeable at the touch of a switch. 45 hours' light from a 6-volt battery. Adjustable for top, bottom or side lighting wherever required. Steel body, robust and weatherproof, grey finish.

Available at Electricians and Hardware Stores everywhere.

Factory Representatives:
OVERSEAS MANUFACTURERS AGENCIES LTD.
P.O. Box 2321, Wellington.

reverse. Therefore some major influence is operating, and this is attributed to migration from rural to urban areas. If people move from rural to urban areas, they must do so as they grow older. Hence there is a higher proportion of older people in urban areas than in rural areas. It also means that there is a smaller proportion of young people in urban areas than in rural ones.

The age groups at which the rural and urban graphs cross differ between males and females. Although varying with the census, the graphs for females cross about 15 years earlier than those for males. The typical group for females is at 15 to 20 years of age, but for males the graphs cross at 30 to 35 years of age. This does not imply that the migration takes place at these ages, but that it is centred around these ages. Whereas the graphs for females cross suddenly and decisively, those for males approach slowly before crossing and widen slowly afterward. This suggests that for girls the movement is concentrated around the 15 to 20 years age group, but that for men the movement is spread over a wide age range.

Age a Factor

Whereas youths and men know that most gainful rural employment is for men and may therefore remain for a number of years, girls or parents of girls, finding little opportunity for gainful employment, seek suitable positions in urban areas at an earlier age. Age thus becomes a factor which helps to determine who will enter the migration from rural to urban areas.

The numbers for each sex which enter the migration also differ. The graphs for males are much closer than those for females, which implies a greater movement in females. The numbers of females per 1000 males for all age groups for counties compared with boroughs and cities are shown in Table 10, and again imply a greater movement of females.

TABLE 10—NUMBERS OF FEMALES PER 1000 MALES

Census	Counties	Boroughs and cities	New Zealand
1926	820	1,072	959
1936	813	1,096	972
1945	888	1,157	1,049

There is a wide difference between the numbers of females per 1000 males for New Zealand and those for counties and boroughs. If both sexes entered the country to town migration in similar proportions, the figures for counties and boroughs should be similar to those for New Zealand. The conclusion is that females leave rural areas in greater numbers than do males.

Age, sex, and increasing scarcity of land are bases for selection, which operates very unobtrusively. Probably others exist, some perhaps peculiar to special areas.

Rise in Maori Population in Urban Areas

Except where relevant the Maori population has been excluded in the previous discussion.

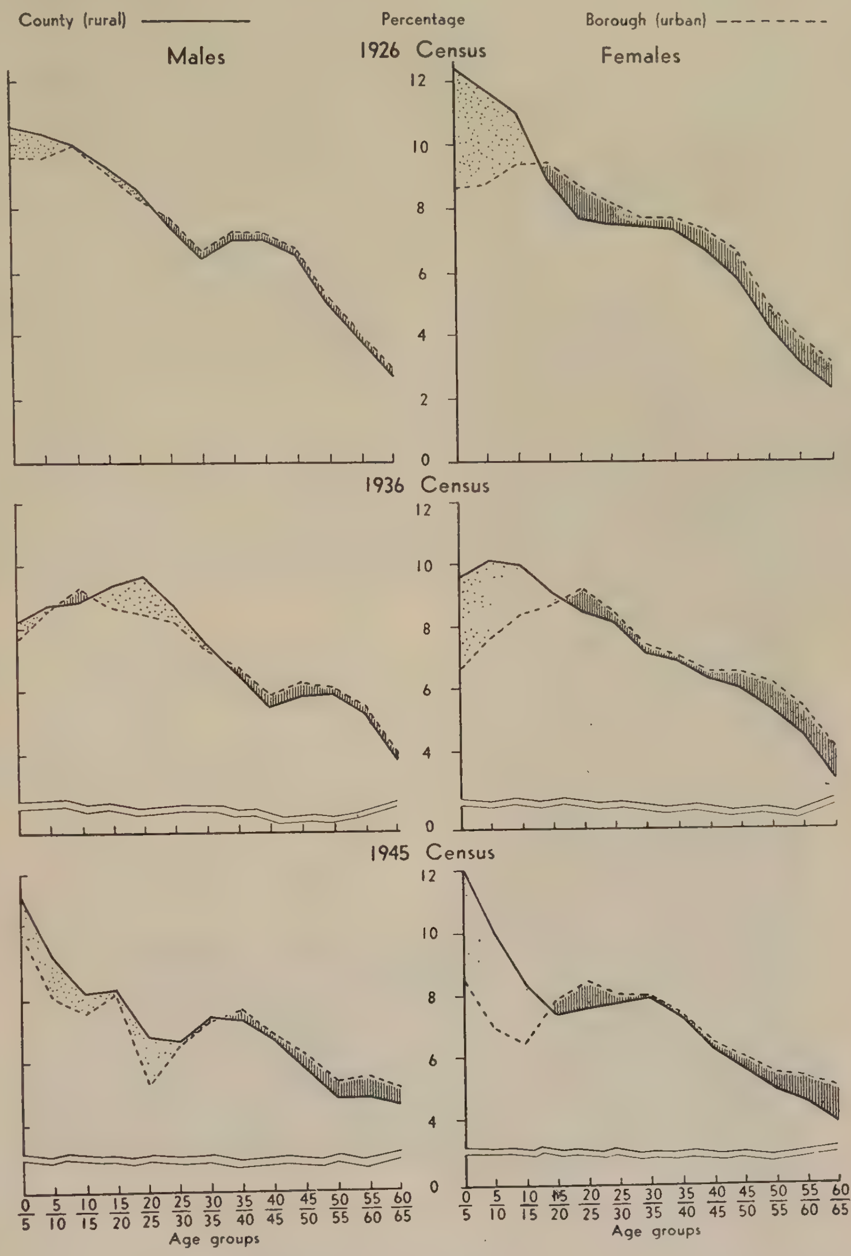
More Maoris and a larger proportion of them than formerly are now living in urban areas (see Table 11). The rising proportion of Maoris in boroughs and cities suggests that country to town migration is in progress and it appears to have been accentuated by the Second World War. Some, if not all, factors that contribute to the migration of non-Maoris probably also affect Maoris, but they may probably do so to a different extent. The very different cultural background of the Maori makes generalisations unwise.

TABLE 11—MAORIS IN COUNTIES* AND BOROUGHS 1926-1951

Census	Counties	Boroughs and cities	Total	Percentage in boroughs
1926	57,937	5,515	63,452	8.7
1936	74,419	7,731	82,150	9.4
1945	82,762	15,758	98,520	16.0
1951	93,219	20,192	113,411	17.8

* Including town districts.

Comparison of Percentage Age Distribution of County and Borough Populations for Males and Females for 1926, 1936, and 1945 Censuses

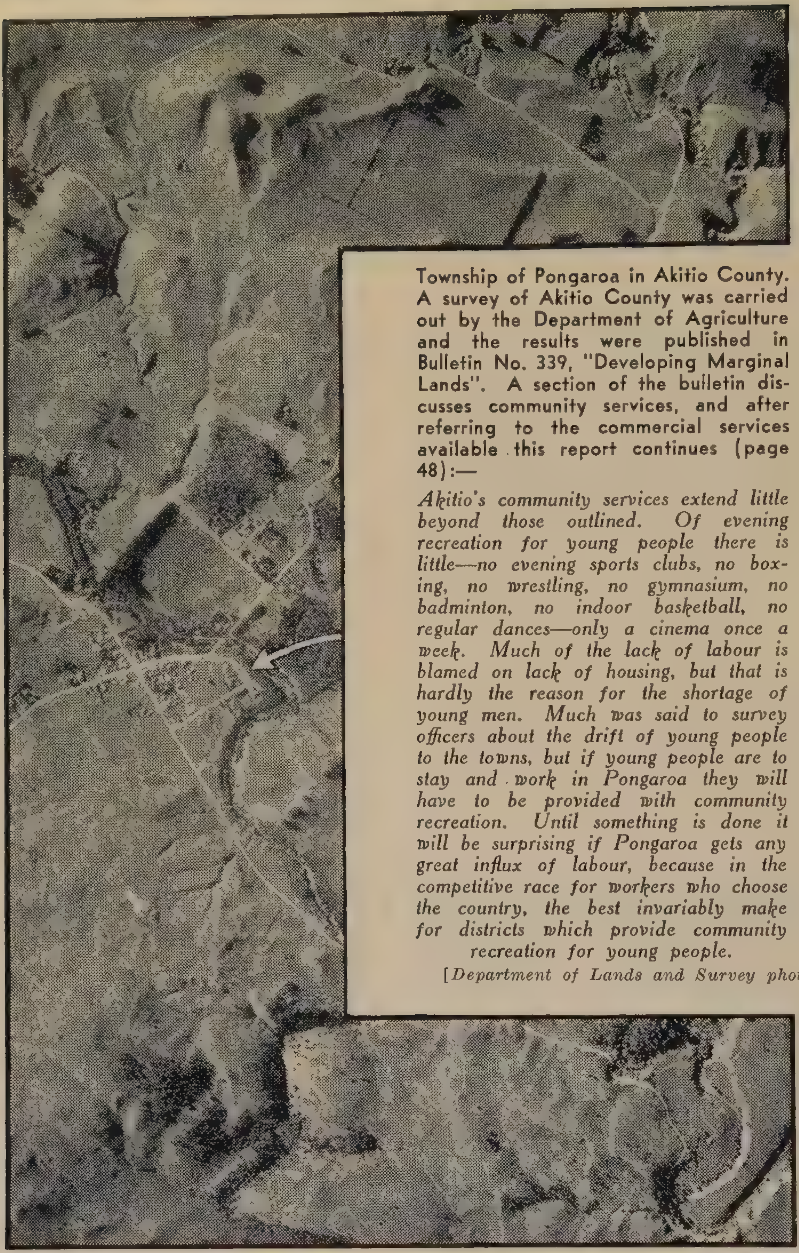


Note: Though the population over 65 years of age was included in preparation of the percentages, it is excluded from the graph.

Conclusion

Migration from rural to urban areas is a permanent population phenomenon which with full employment reaches high levels and with unemployment recedes. Often those involved become a target for a few who approve the rural way of life, but disapprove of the urban. For the reasons given it seems impossible to stop the flow. It may conceivably be retarded, but is never likely to cease.

A wise view is to recognise its inevitability and to understand the problems of those compelled to



Township of Pongaroa in Akitio County. A survey of Akitio County was carried out by the Department of Agriculture and the results were published in Bulletin No. 339, "Developing Marginal Lands". A section of the bulletin discusses community services, and after referring to the commercial services available this report continues (page 48):—

Akitio's community services extend little beyond those outlined. Of evening recreation for young people there is little—no evening sports clubs, no boxing, no wrestling, no gymnasium, no badminton, no indoor basketball, no regular dances—only a cinema once a week. Much of the lack of labour is blamed on lack of housing, but that is hardly the reason for the shortage of young men. Much was said to survey officers about the drift of young people to the towns, but if young people are to stay and work in Pongaroa they will have to be provided with community recreation. Until something is done it will be surprising if Pongaroa gets any great influx of labour, because in the competitive race for workers who choose the country, the best invariably make for districts which provide community recreation for young people.

[*Department of Lands and Survey photo.*

wrestle with it. One problem is the transition from rural to urban ways of life. The familiarity of people with one another in a rural community can be a striking contrast to the loneliness of an individual in a city.

The problems will vary between individuals and according to the ways in which people eventually reach the larger towns. For example, the problems of a boy entering the local branch of a large commercial institution from which in a year or two he is transferred to another branch in a major centre can be compared with those of one who enters an unskilled occupation in a small local business and then, for a variety of reasons, moves to a job in a larger town and eventually to a city. The former is in a large institution which will usually exhibit some interest in his welfare, but the employers' interest in the latter will be much more limited, particularly in a manual occupation. Little is known of the ways by which people move from rural to urban areas, but such knowledge is important, because it might help many to ease their transition from rural to town life.

Parents' Problem

For parents who desire their children to remain in rural areas the problem is great. They must devise ways to build up and retain in their children such an active interest in country life that not only will the children desire to remain, but they will struggle to do so. For groups of young people the struggle against the social forces is very unequal.

The impact of the migration from rural to urban areas on farm labour is great. In times of full employment, when the migration is at high levels, farmers are compelled to seek methods of farming with a minimum of labour. This is a short-term result. The long-term effect is very complex, but, in so far as the newer methods displace the need for some farm labour, it is one of many social forces which bear on the proportion of rural to urban population and thus on the farm labour force.

Effect on Farm Development

Many classes of farm activity are affected directly or indirectly by fluctuations in the migration to towns. Probably mechanisation tends to be most intensive in times of full employment, but with unemployment expansion in use of machinery eases. Some operations, such as fencing, require both capital and labour, and others, such as scrub cutting, require mainly labour. Probably the time when either of these types of operations is done or the extent to which they are done is closely related to the economic conditions of the farmer and the level of country to town migration.

Farmers who desire farm labour must be prepared to provide living standards and to pay wages that enable them not only to compete with urban industries but to offset for the farm employee the loss of social amenities which he would enjoy in an urban environment. Today, through travel and reading, knowledge passes freely, and if rural life is not made at least as attractive as urban life, many who would become excellent farm workers will inevitably enter the migration to towns.

References

Except where stated the statistics have been extracted directly or compiled from various volumes of the censuses, Year Books, the Monthly Abstract of Statistics, and the annual reports of agricultural and pastoral statistics, vital statistics, and population and buildings issued by the Census and Statistics Department.

1. "Population Problems", P. H. Landis.
2. "Population Census 1936", Vol. 1, p. IX.
3. Estimates of Department of Agriculture.
4. 1951 annual report of the New Zealand Meat Producers Board, p. 55.

"Principles of Rural-Urban Sociology", P. Sorokin and C. C. Zimmerman.

◆

"The Right Way to Keep Dogs": R. C. G. Hancock

THE author of this book (3rd rev. ed.) is the well-known "Radio Vet." of the British Broadcasting Corporation. Though the book is written for British conditions—for example, there is no reference to hydatid disease—the mass of information which has been compressed into a very small compass will be interesting and useful to New Zealand owners, whether of pets or working dogs.

The chapter on dietetics is good and should be of particular interest to owners of working dogs on small properties where dog "tucker" is a problem. Breeding and training are also discussed concisely and well. There is an excellent summary listing and describing 94 different breeds with black and white illustrations of 31.

—*A.D.M.G.L.*

Elliot, Surrey. 7s. 6d. in New Zealand.

◆

Grape Growing in the Home Garden

By F. BERRY-SMITH, Viticulturist,
Department of Agriculture, Auckland

TRELLISING, manuring, cultivation, and control of diseases and insect pests are discussed in the concluding section of this article on grape growing in the home garden. The first part, which appeared in last month's "Journal", dealt with establishment and training and pruning.

[Sparrow Industrial Pictures Ltd. photo.

SUPPORT is necessary for the main arms and seasonal growth of the vine and to give this various styles of trellising have been devised.

The best type of low trellis, in the writer's opinion, is illustrated in Fig. 14. The bottom wire is 20in. above the ground, leaving plenty of room for clean cultivation under the trellis and for air circulation. Above this may be two or three sets of double wires. No further spacing than the thickness of the posts, which may be 4 to 6in. wide, is necessary. The lower set of wires is only 7in. from the bottom wire to secure the young laterals in the early stages, when they are brittle and most liable to wind damage.

As soon as the shoots are long enough they should be tucked between the wires, and they will secure themselves by their own tendrils without being tied. As growth continues the shoots should be tucked between the upper sets of wires. When the foliage protrudes about 6in. above the top wire the tips should be broken off. Any sublateral growth should also be checked to avoid congestion.

When the fruit begins to colour any overhanging leaves should be removed to expose the bunches to sunlight and promote ripening. Summer pruning should never be too drastic, as it has a weakening effect on the vine. A moderate check to the growth diverts the energies of the vine from foliage formation to fruit development. Removal of surplus growth also prevents congestion which encourages fungous diseases.

Brick Wall with Sunny Aspect is Ideal

A brick wall with a sunny aspect is ideal for grapes. The extra sun heat absorbed and radiated from a wall on to a vine promotes the ripening and colouring of the grapes to a degree unobtainable in the open.

There are some disadvantages in growing a vine against a wooden wall. A vine in such a position makes painting very difficult and the foliage is likely in time to induce rot in the timber. If it is decided to plant vines on the sheltered, sunny side of a wooden house, it is preferable to erect a trellis similar to that shown in Fig. 14 about 1ft. 6in. out from the wall.

Pergola over Driveway

Vines also make an attractive showing on a pergola erected over a driveway or path. Fig. 15 illustrates the system of training. The weight of the foliage and crop bears the growth down on to the trellis for the most part and training the growth is not as difficult as may be imagined. The sides of the pergola may be filled in with vines as shown or left open.

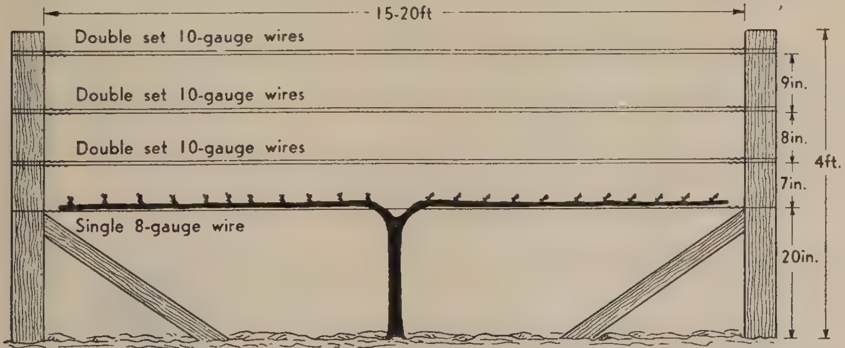

15-20ft
Double set 10-gauge wires
Double set 10-gauge wires
Double set 10-gauge wires
Single 8-gauge wire
9in.
8in.
7in.
20in.
4ft.

Fig. 14—Low trellis.

Manuring and Cultivation

The following manures should be applied regularly in September each year and cultivated into the soil: Bonedust, superphosphate, or basic slag, 4oz. per square yard; sulphate of potash, 2oz. per square yard; lime, 2oz. per square yard; sulphate of ammonia, 1oz. per square yard. The border area for a large mature vine should be about 10 sq. yds.

Manures must not be applied under the trellis, as this will encourage rank weed growth where it is rather awkward to tackle with the hoe. The rates of application recommended are fairly liberal and in most circumstances no advantage will be gained by exceeding them. If the vines appear to be excessively vigorous, sulphate of ammonia should be omitted. On the other hand if growth is somewhat pale and weak, the cause is generally a nitrogen deficiency and the vines will benefit by increasing the application of sulphate of ammonia to 2oz. per square yard.

Fowl manure is excellent for vines. It is rich in phosphate, potash, and calcium and also contains a useful amount of nitrogen when fresh. Fowl manure alone applied at the rate of about 1lb. per square yard will supply all normal nutritional requirements of the vine. The manure should be lightly forked into the topsoil. In soils of low fertility the addition of compost to the vine border is beneficial.

It is important that cultivation of the vine border should be shallow. Deep cultivation will drive the rooting system into the cold, infertile subsoil, causing the vine to decline in vigour and to fail to colour properly and ripen its fruit.

In early spring and autumn the ground may be opened up to a maximum depth of 4in. Cultivation during

FOR YOUR SUMMER JOURNEY

Express Trains Offer Roomy Travel-Comfort

When planning your summer travel, remember that trains provide you with very comfortable service at reasonable cost; often the lowest cost.

During the summer holidays, more than 330 extra long-distance trains will serve New Zealand's principal towns and cities. The regular night express trains between Auckland and Wellington will be supplemented at the height of the season by the popular "Daylight Limited". Between Christchurch, Dunedin, and Invercargill, the fast, modern "South Island Limited" resumes its normal thrice-weekly schedule as from December 15. Most provincial express trains run daily from mid-December to mid-January.

Seats may be reserved two months ahead of travel date.

Book NOW for Holiday Happiness

If you switch to

DRY DRENCHING

with "PHENOVIS"

Phenothiazine Pellets

You'll Drench Quicker And Minimise The Risk Of Wool Staining.

THIS scientific phenothiazine DRY drench has won New Zealand-wide praise.

"PHENOVIS" Pellets are safe, accurate, labour-saving. Accurate dosage is certain because each contains exactly 5 grammes of phenothiazine. The dose, given by a special instrument, ensures no "spit-out" and minimises risk of wool staining during drenching. Easier to carry than heavy liquids —and there's much less chance of waste. Order now for the season ahead.

Distributors:

SUMMIT PRODUCTS LTD.

Box 328, Palmerston North.

PREVENT THAT CHECK AT WEANING

No check at Weaning is the rule where Calves are wisely fed on ***Tomoana Calf Pellets***

CONTAINING linseed meal, fish meal, meat meal and selected cereal meals, Tomoana Calf Pellets can be FED DRY, and in this way the calf's digestive organs become more easily accustomed to solids.

Calves grow steadily and without check into robust and sturdy yearlings.

Feed **TOMOANA**

CALF PELLETS

Ship via London

The

PORT OF LONDON AUTHORITY

A Self-governing Public Trust for Public Service

For full particulars apply to :
Mr. W. C. Perkins,
22 Loftus Street,
Sydney.

London—the Premier Port of the Empire—equipped for all types of ships and cargoes.

the growing period should consist only of keeping the border free of weeds and the surface loose. The object is to encourage the vine to form a well-developed system of feeder roots in the warm, fertile topsoil, which will give best results.

Control of Diseases and Pests

In the middle of August a dormant spray consisting of 1 part of lime sulphur in 10 parts of water should be applied. At this time the buds are swelling and spraying at this stage is more effective than earlier. This spray is important, as it reduces later the incidence of mildews and attack by the grape erineum mite and lecanid scale.

When the shoots are 4 to 6in. long a spray consisting of a mixture of 3oz. of copper oxychloride, 2oz. of colloidal sulphur paste, and 1oz. of 50 per cent. wettable D.D.T. per 4 gallons of water should be applied.

This spray should be repeated about every 3 weeks up to the time the grapes start to colour, after which further spraying is not usually necessary. If a prolonged period of wet, muggy weather occurs, additional applications are necessary.

The most important sprays apart from the one applied at the dormant stage are:—

1. When the shoots are 4 to 6in. long.
2. Just before flowering.
3. When the fruit has set.
4. When the berries are about half developed.

What additional sprays are required will depend on the weather. In Auckland district, where wet, humid conditions conducive to fungous disease often prevail in summer, more spraying is necessary than in the drier climate of Hawkes Bay or Nelson.

It is not good practice to apply liquid sprays during the flowering period, as this interferes with the setting of the berries to some extent.

Dusting with Sulphur

Liquid sprays applied later than No. 4 may leave noticeable amounts of residue on skins of ripe grapes, which will detract from their appearance for table purposes. It is therefore preferable to stop liquid sprays when fruit is about half grown, if weather conditions permit. After this stage of development powdery mildew on the fruit is the worst trouble, but it can be controlled by dusting with flowers of sulphur, a specially fine grade of sulphur prepared for dusting. Suitable hand dusting guns are procurable from most suppliers of gardening equipment. On a clear, hot day the action of the sulphur is most efficacious and such weather should be chosen for the treatment. The dust should be applied to all foliage, particularly to bunches.

In a normal season four copper sprays at the periods already specified and six dustings of sulphur are sufficient to ensure healthy growth and clean fruit.

Thinning and Covering Bunches

The enthusiast who wishes to excel in quality may thin the bunches and enclose them in paper or clear cellulose wraps open at the end and extending a little beyond the end of the bunch. A suitable time for this attention is when the berries are about the size of peas. Thinning results in an appreciable increase in berry size and better formed bunches.

Grape Pergola to Beautify Driveway

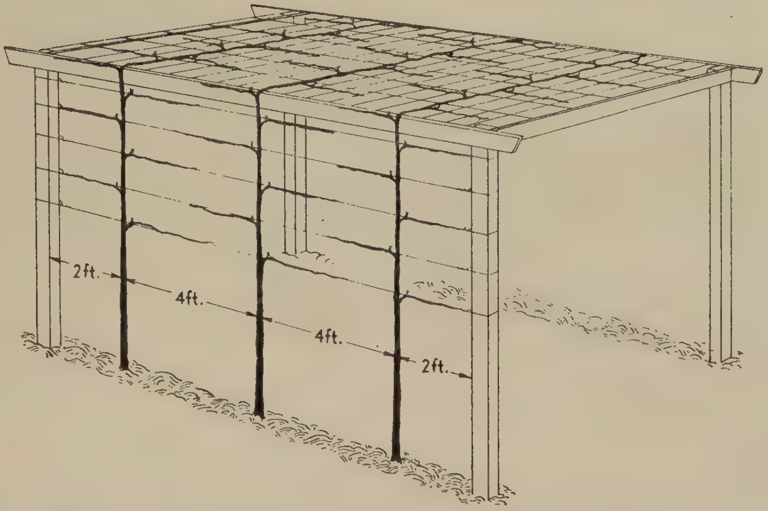


Fig. 15—The vines are spaced 4ft. apart, the end vines being 2ft. from the end posts of the pergola. The annual fruiting canes are tied to wires on alternate sides of the vine arm. The vine in the diagram is a strong specimen as it would appear after pruning; note that each cane is provided with a two-bud spur for replacement purposes the following year. The first cane is laid down about 3ft. from ground level to allow for good air circulation under the pergola. With vines of moderate vigour leave only spurs of two to three buds.

If the pergola runs east and west, both sides will get sunshine and may be covered with foliage. To do this vines should be grown from both sides spaced as shown with the arms meeting at top centre. Where it is necessary to run the pergola north and south there will be insufficient sunshine to justify planting the south side.

Thinning is done with a pair of sharp-pointed scissors, any shoulders being removed from the bunch and about two berries being cut out for every one left. The bunch is then given a liberal sulphur dusting and the covering is drawn on and tied to the stalk. The cover protects the bunches from birds and weather. Unless the end is open to some extent the fruit will sweat and rot.

The advantage of covering the bunches applies mainly to late varieties, on which fruit ripens properly only if left on the vine until late in the season. Black Hamburgh and Alphonse Lavallee mature very well with a protective covering.

Protection against Birds

Birds are a pest in most parts of New Zealand. If the individual bunches are not covered as described, vines on a low trellis may be covered with disused fish netting to protect them from birds. Another method is to run a length of ½in.-mesh netting along either side of the trellis and lace and tie the tops together through the trellis.

The following description of the most prevalent diseases and insect pests of the vine will enable them to be identified if they occur. Specific control measures are given, but normally the routine application of the simplified spraying schedule previously described will protect the vine from the troubles listed.

Downy Mildew

Downy mildew causes pale areas to appear on the upper surface of the leaf and forms a dense white down on the under side of the leaf. This down consists of the sporing bodies thrown out by the fungus from inside the tissues. Fruit and shoots are sometimes damaged by this disease, but the leaves are most subject to attack and vines have been almost completely defoliated by severe infection.

The spores formed under the leaf serve to propagate the disease and in wet, humid weather downy mildew spreads very rapidly. The application of copper sprays is an effective control measure. It is difficult to control the disease properly once it is established, and spraying should be applied as a preventive. Traces of copper on the foliage from spray residue destroy the spores of the fungus before they can grow into the tissues of the leaves. Bordeaux 3:4:50 or copper oxychloride at the rate of 3½lb. per 100 gallons of water is generally used. If spraying is thorough and regular, weaker sprays are still effective. Trials have shown that the lowest concentration of Bordeaux mixture for reliable control is a 2:2:50 formula.

Powdery Mildew

Powdery mildew, also called oidium, attacks all green parts of the vine, including the fruit, and appears as a dusty greyish film. Whereas downy mildew is confined to the under side of the leaf, powdery mildew is most noticeable on the upper side, though it may be present below as well.

Powdery mildew leaves black markings on the wood and fruit. If the bunches are attacked before or shortly after flowering, the flowers or small developing fruits fall off. It is more usual for the fruit to become mildewed when it is about half developed, and at this stage splitting of the berries usually occurs.

Warm, humid weather favours the spread of powdery mildew. Its spores can germinate if humidity is high without water being present as is necessary for the germination of downy mildew and black spot. For this reason powdery mildew occurs in glasshouse vineries and downy mildew or black spot do not, as they require a droplet of rain to hatch their spores.

Powdery mildew may be controlled by incorporating colloidal sulphur or wettable sulphur with other sprays or by application of dry sulphur as a fine dust. Sometimes lime sulphur spray at a strength of from 1 : 150 to 1 : 200 is used to control severe infection.

Black Spot

Black spot, also referred to as anthracnose, appears on early-spring growth, the most serious damage usually occurring before blossoming. The young shoots and bunches are blackened and withered by the disease. On the older wood open black scars, which first appear as small black spots, are formed.

When the berries are attacked later in the season the fungus forms slightly depressed, scaly spots with a greyish pink centre and a dark brown to black margin.

In a wet spring or summer black spot can do much damage to vines and crop. Copper sprays are used to control black spot, but a more concentrated spray than recommended for downy mildew is required. If black spot appears, the strength of the Bordeaux should be increased to 5 : 4 : 50 and of copper oxychloride to 5lb. per 100 gallons. Bordeaux appears to be the more effective.

Botrytis Rot

Botrytis rot attacks the bunches late in the season. Infection usually follows injury to the berries from birds, insects, or splitting of the fruit by wet weather. The disease appears on the bunches as a felty mass of grey mould which makes the fruit rotten. Control by spraying has not proved very satisfactory. At the late stage that botrytis makes an appearance spraying would leave undesirable residue. Apart from this, the close formation of the bunch and the waxy bloom on the berries make effective spray coverage well-nigh impossible.

The enclosing of the bunches in suitable bags will obviate trouble from botrytis. Thinning of the foliage around the bunches, permitting quicker drying of the bunches after rain, reduces the incidence of botrytis as also does protection from birds and insect damage.

Grape Vine Moth

The caterpillars of the grape vine moth are about 2in. long when fully grown. There is an intricate pattern of fine black lines and spots on the body, which is yellowish at the head and reddish at the hind end. Numerous hairs appear along the body.

This caterpillar eats the foliage and developing fruit. It may be controlled by including lead arsenate at the rate of 1½lb. per 100 gallons with other sprays. Alternatively, 1lb. of 50 per cent. wettable D.D.T. per 100 gallons of spray can be used.

Leaf-roller Caterpillar

Leaf-roller caterpillars are small green insects characterised by the way they join the leaves together by fine silken threads. They eat the leaves, fruit, and fruit stalks at all stages.

Lead arsenate at the rate of 1½lb. per 100 gallons will eradicate this pest.

Mealy Bugs

Mealy bugs are small, white, torpid creatures which look like flakes of oatmeal. They suck the sap from the leaves and berries and leave a sticky, sweet secretion on which develops a black, sooty fungus. They can be controlled by including 1lb. of 50 per cent. wettable D.D.T. in the copper sprays.

Thrips

Thrips are extremely tiny insects which damage the grape flowers, preventing the fruit from forming. D.D.T. as for mealy bugs should be used to control them.

Vine Mites

Vine mites are microscopically small insects which produce characteristic blisters on the vine leaves. Under these blisters a felty white mass of hairs is developed.

As the mite hibernates under the bud scales, a 1 : 10 lime sulphur spray at the dormant stage is an active deterrent. Sulphur used in routine spraying for control of powdery mildew also controls vine mites.

Borers

The activity of borers is confined mainly to the older wood of the vine. Presence of borers is indicated by a gummy exudation of wood crumbs.

Borers may be destroyed by asphyxiating them with petrol. A few drops can be injected into the hole with an oil can, and the hole plugged with a piece of clay.

Grape Vine Weevil

The grape vine weevil can cause considerable damage by eating the foliage and bunches. The beetles are hard to detect, as they eat mainly at night and conceal themselves cunningly by day beneath old bark and twine and in the soil. Arsenate of lead or D.D.T. at the rates previously recommended for caterpillars will destroy this insect.

Brown Beetle

The brown beetle, which is the adult of the New Zealand grass-grub, is about ½in. long. The beetle is on the wing at dusk during November and early December and is capable of causing considerable damage by feeding on vine foliage. Control is as for grapevine moth.

Lecanid Scales

Lecanid scales are brown, elongated, oval structures up to a ¼in. long which adhere to the woody parts of the vine and live by sucking the sap. If sufficiently numerous, they will seriously weaken vines. For control lime sulphur 1 : 10 or winter oil 1 : 25 should be applied at the dormant stage.

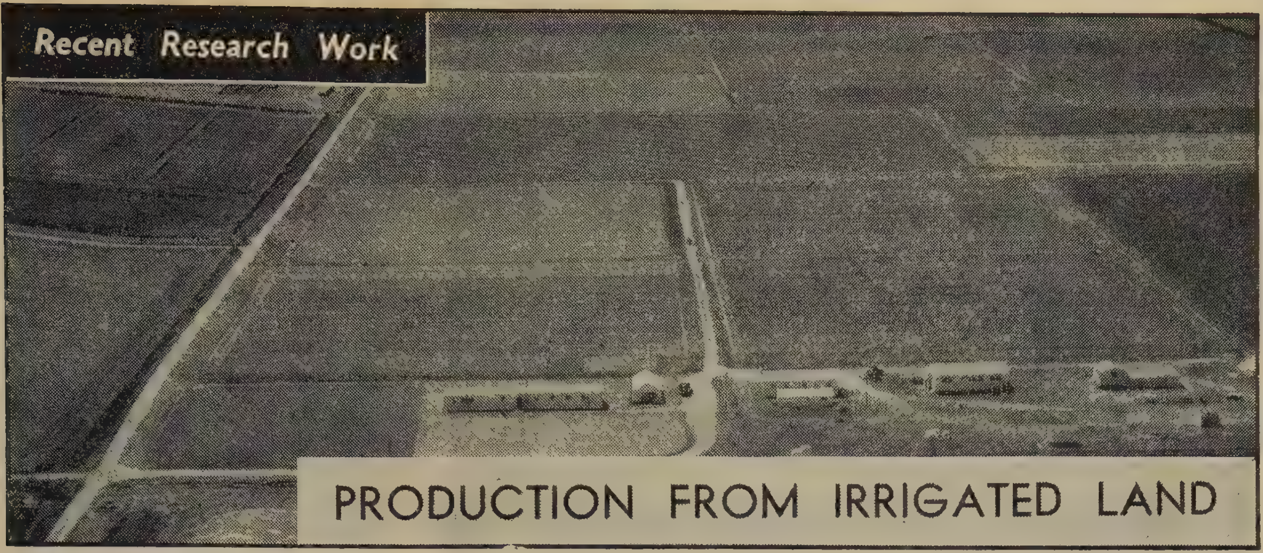
More detailed information on grape growing is contained in Department of Agriculture Bulletin No. 354, which is available at 2s. 6d. post free from main offices of the Department.

Protecting Ryegrass Seed from Weather

USUALLY it is necessary to keep Certified ryegrass seed on the farm for a short time after harvest until there is room in the seed-cleaning store. When ryegrass straw is baled immediately after harvesting, some of the bales can well be used as a base on which to stack the sacks of seed in the same paddock. Stacked on a layer of bales with a tarpaulin over them, sacks are protected from bad weather, away from most fire risks, and safer from vermin than in most sheds. Seed stacked in the paddock is less likely to heat than it is when put in a shed soon after harvesting. As well as these advantages, stacking sacks of ryegrass in the paddock for a short time saves valuable shed room. Certified seed should be stacked as shown to facilitate branding and sealing.

—*R. M. COMER, Fields Instructor, Department of Agriculture, Ashburton*

Recent Research Work



HEADING PHOTOGRAPH: The Department of Agriculture's Winchmore Irrigation Research Station. Auster Airviews photo.

PRODUCTION FROM IRRIGATED LAND

THE effect of irrigation on the growth of grass and also on the growth of the more common farm crops is being investigated at the Department of Agriculture's Winchmore Irrigation Research Station. For the period January to April inclusive of this year the rainfall totalled 4.55in., which made conditions ideal for the testing of the value of irrigation, and the results of trials carried out this year are given below.

SOIL AT WINCHMORE

THE soil (Lismore stony silt loam) on the Winchmore Irrigation Research Station is typical of much of the light land in Canterbury. It consists of about 18in. of soil and subsoil combined resting on a great bed of shingle of indeterminate depth. The soil itself has a poor physical structure and is low in organic matter, its pH is low (about 5.1), its phosphate content is also low, and it has a lime requirement of about 2½ tons per acre. The water-holding capacity of the soil is fairly high, about 27 per cent., and the wilting point is approximately 10 per cent. This gives a fairly wide range of available water. With an average rainfall of only 28in. the soils tend to dry out rapidly during summer. The carrying capacity of the land would vary between 1 and 1½ ewes per acre on the better-quality land down to ¾ ewe or less on the more shallow soil types.

AUTUMN-SAVED GRASS

ONE method of prolonging the period in which stock can be grass fed is to use some of the growth produced in autumn for winter and early-spring feed. This practice has been carried out at the Station for the past two or three seasons and has given excellent results. During March and April certain paddocks are spelled from grazing and are irrigated when considered necessary. The growth conserved during this period is fed to breeding ewes throughout winter; that is, grass is being substituted for turnips, swedes, or some other greenfeed crop. Experience at the Station suggests that 1 acre of conserved grass is sufficient to winter about 10 ewes. Although heavy and continuous frosts are experienced (up to 17 degrees), there has been no undue frosting of the growth even where the pasture contains a good proportion of clover. On the dairy farm the autumn-saved pasture is fed to the newly calved cows in August and early September.

BUTTERFAT PRODUCTION

IT is recognised that the typical light land of Canterbury is totally unsuitable for dairying, mainly because pastures usually become very parched and dry during summer and autumn. By the use of irrigation on this class of country research workers at the Station have extended the dairying season and have gone a long way toward obtaining conditions comparable to the higher-rainfall areas where dairying is normally carried out. On the Department's 150-acre dairy farm butterfat production over the past three seasons has been as follows: 1949-50, 15,509lb.; 1950-51, 18,541lb.; 1951-52, 19,397lb. A total butterfat production of 22,500lb. or 150lb. of butterfat per acre seems likely to be attained.

FAT-LAMB PRODUCTION

A TRIAL to demonstrate the carrying capacity of irrigated grass has been in progress for the past 3 years. Ewes are confined to a 27-acre grass farm subdivided into 9 paddocks which vary in size from 2¼ acres to 5 acres. Feed for the ewes and lambs consists of grass plus hay and silage produced on the block. The trial began when 90 2-tooth ewes were put on the area in June 1949. Additional ewes have been added from time to time as the feed supply increased and in June this year 189 ewes were being grazed on the area. This represents 7 ewes per acre. The ultimate number that can be carried is not known, but it may quite possibly exceed the present figure. The above carrying capacity has been obtained under trial conditions, and it is unlikely that this figure would be reached under practical farm conditions.

—*G. K. McPHERSON*

* * * *

WHEAT PRODUCTION

AVERAGE wheat yields on the light plains of Canterbury are about 30 bushels per acre. Yields on the Station this season indicate that under irrigation considerably increased yields are possible. On the Mixed Farm Unit a 15-acre field yielded 44½ bushels per acre, the crop being autumn sown after rape. A yield of 38 bushels per acre was obtained from a 6-acre paddock on the Research Block, in which autumn-sown wheat followed a 3-year irrigated pasture. As most wheat is autumn sown and thus occupies the ground during a period when soil moistures are usually fairly high, it is thought that greater benefit to yields arises from the fertility build-up resulting from heavier stocking and improved pastures under irrigation than from the application of water during the growing period.

This season a trial was carried out to compare the yields of irrigated and non-irrigated wheat. Cross 7 and W.R.I. Yielder were drilled on 29 May both at 2 bushels per acre. Irrigation of half the plots was carried out on 22 November, when the crop was observed to be wilting slightly in the heat of the day. The wheat was header harvested on 12 February and results showed an increase of 2.9 bushels per acre on the irrigated plots. This increase was obtained by a single application of water this season, when rainfall from drilling to harvest totalled 17.65in. It is hoped to conduct further trials to investigate the effects of different times and frequencies of irrigation on wheat in future years.

ROOT CROPS

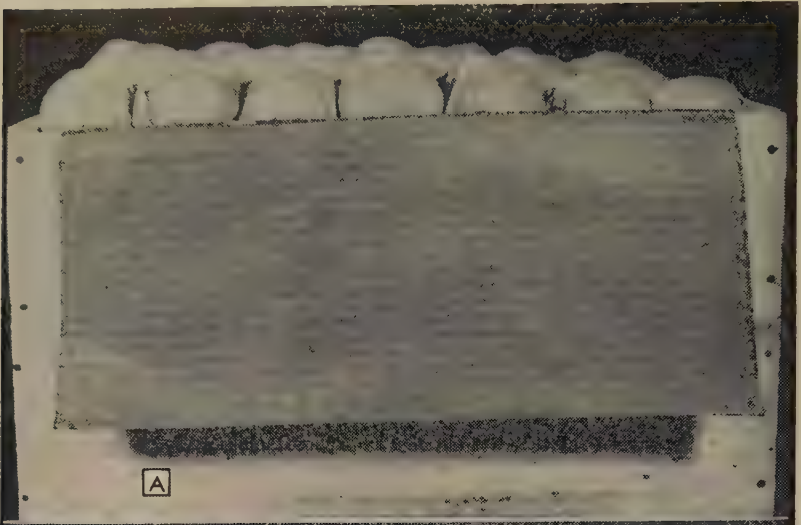
DURING the past season irrigation has proved particularly beneficial for the production of root crops. Irrigated swede crops produced over 30 tons per acre, whereas the yield from non-irrigated swedes was only 5 tons; irrigated soft turnips produced over 20 tons, compared with a yield of 3 to 4 tons for non-irrigated areas. Mangolds and sugar beet also yielded satisfactory crops under irrigation, and rape yields were trebled with irrigation.

—*D. WALKER*

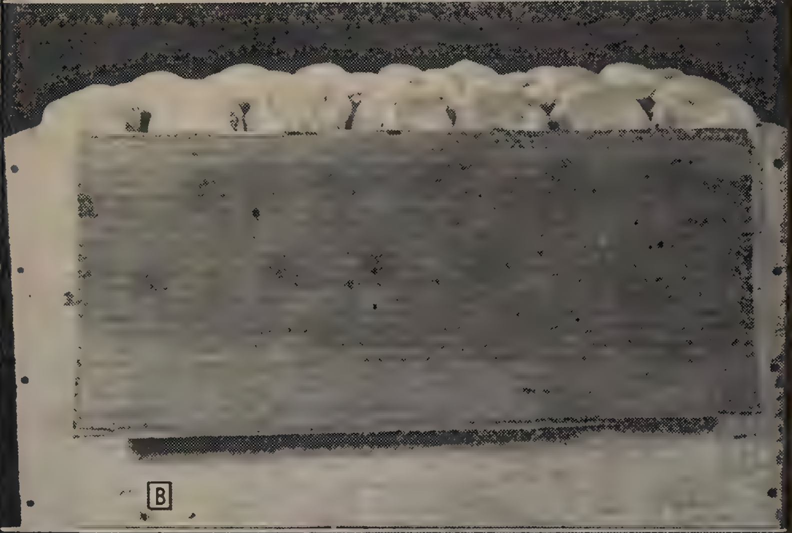
Common Faults in the Packing of Apples

By R. I. JUNE, Horticultural Instructor,
Department of Agriculture, Hastings

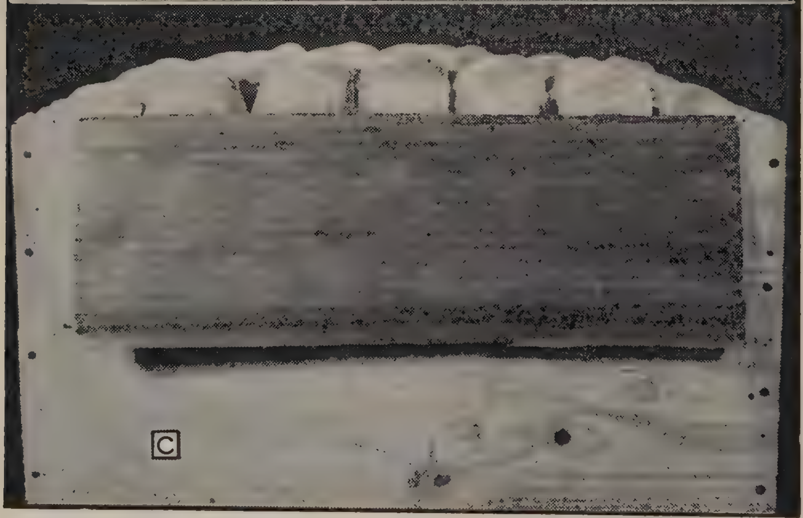
THE present standard of apple packing in New Zealand could be improved a great deal by attention to small details. In this article photographs illustrate some common faults found during inspection. Other points on packing and packing faults were dealt with by the author in the December 1950 issue of the "Journal".



A



B



C

PACKING has an important effect on the storage life of fruit; attention to correct height, careful wrapping, and careful placing of each fruit will prevent a great deal of bruising. Care on these points should ensure that the fruit when opened will be in good condition and of pleasing appearance. Appearance as well as soundness is of great importance to the fruit growers of New Zealand, especially when fruit is to be sold on overseas markets.

* * *

A—This case has been packed high at one end and low at the other, a common fault with beginner-packers. It can be caused by failure to pull back the fruit in the bottom layer when the layer is about three-quarters complete. If the last few apples are forced into the bottom layer, the pockets tend to be smaller at this end. Near the packer they are more open and succeeding layers fit deeper into the larger pockets at this end than the other, resulting in uneven heights. On the other hand if the bottom layer is pulled back too soon, the reverse effect is obtained.

Cases packed in this manner are subject to severe bruising at the high end, no matter how carefully they are handled on the lidding press. Fruit is not only bruised but cutting against the end of the case may occur.

• • •

B—This illustrates a level finish with the end fruit too high above the end of the case. Bruising and damaging of fruit will probably result from such packing. The third and succeeding layers should be pressed down firmly with the palms of both hands at either end of the case and as each layer is completed. The centre should not be pressed.

• • •

C—This illustrates the crown pack obtained by firming the fruit at each end of the case as the pack proceeds. The result is the fruit near each end of the case is only slightly above the case and is not damaged when the lid is nailed down under pressure. The pack is firm and bruising and cutting of end fruit are eliminated.

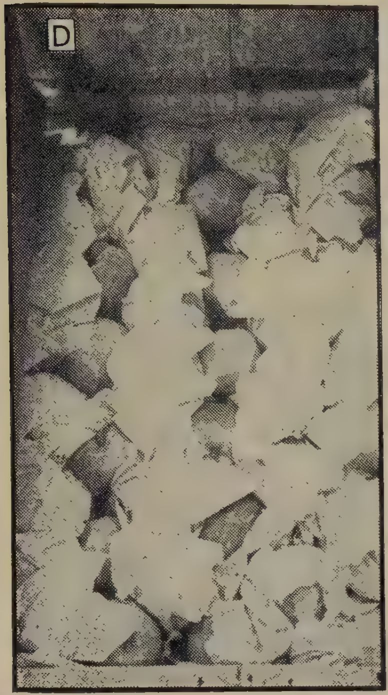
All photographs by R. W. Orr.

Illustrations D to F are from photographs taken of cases as they were received for inspection direct from the grower's shed. These cases were retained by Horticultural Inspectors to illustrate packing faults.

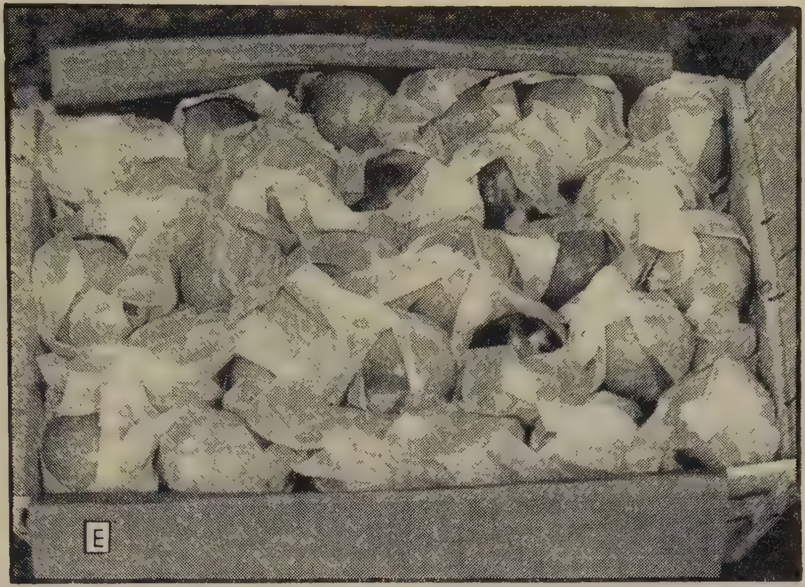
* * *

D—Slack pack: The photograph shows the fruit settled down well over 1in. by handling between the grower's shed and the inspection bench. If the fruit were stored for a considerable time, further shrinkage would take place and such a pack would be of light weight and possibly bruising in handling would occur, because the fruit would move in the case.

Failure to press the liners well into the corners can be a cause of this fault, as it brings about a rounded or false bottom on which the fruit is placed. Failure to press the top layers well down as they are packed is another cause. The case may look high enough when completed, but if the pack is not firm, it soon settles with handling. Slack pack is the cause of a high percentage of rejections at inspection points. This case was alternately wrapped for local-market requirements.



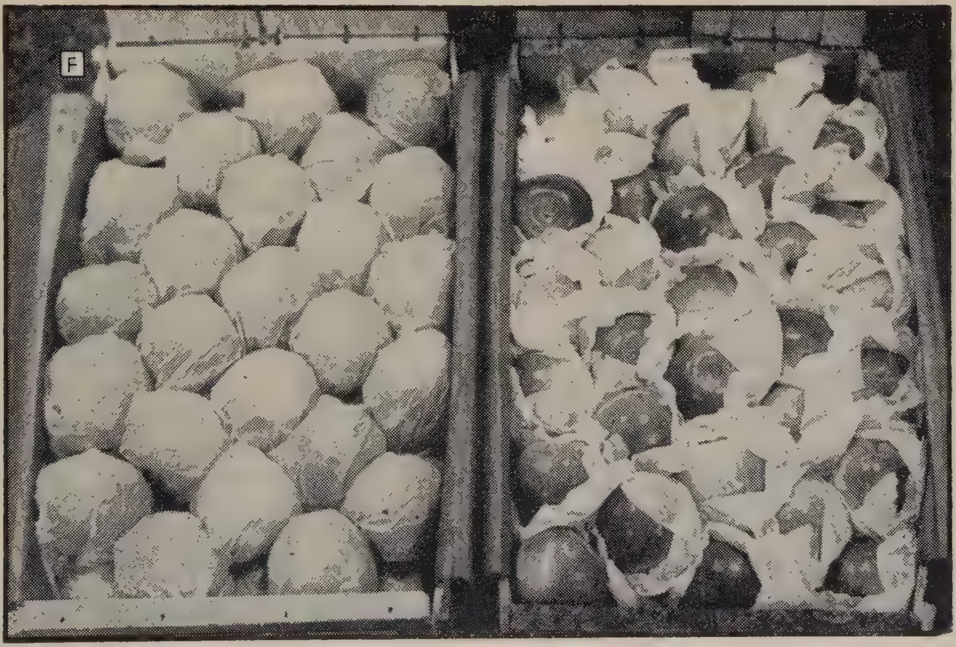
* * *



E—Poor wrapping: Correct tuition in packing at the start would overcome wrapping such as this; it is important not to force speed until placing and wrapping comes naturally to the packer. There is little protection from the paper in careless packing such as this.

Where treated paper is used, such as that impregnated with oil to prevent storage scald, much of its effect is lost when each fruit is not completely covered. The result is a line of poorer keeping quality. One careless wrapper in a packing shed can spoil a whole line for long storage, as the line can be kept only as long as the poorly wrapped fruit will allow.

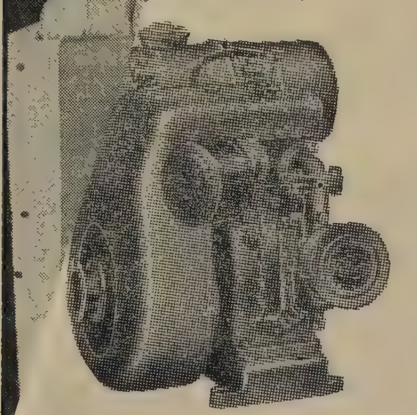
* * *



F—Two export cases, that on left well wrapped, with uniform rows and fruit completely covered, and on right only partially wrapped. The paper is of little use for protection. Further, the right-hand case illustrates complete lack of attention to placing of the fruit. Cheeks, stems, and calyxes are showing in all directions. The stems or calyxes should face one end of the case, except in the end rows, when calyxes should be turned outward to prevent stem punctures.

Attention to all the details mentioned will lower the incidence of stem punctures and bruising, which reduce the storage life and market value of the fruit, and will improve the appearance of the package when opened in the markets.

Commc the job . . .
T THE
LLIERS
O IT!

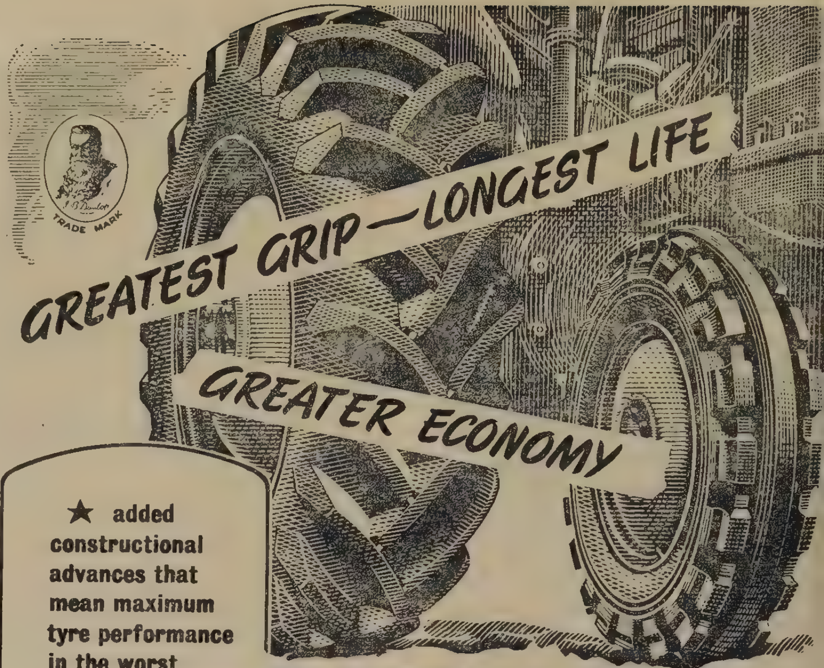


Villiers will power — Shearing Machines ● Cultivators ● Generators ● Water Pumps ● Vacuum Pumps ● Chain Saws ● Inboard Engines ● Compressors ● Lawnmowers ● Rock Drills ● Concrete Mixers ● Spraying Equipment ● Saw Benches.

Villiers

LIGHTWEIGHT ENGINES
1, 2, 2½, 4 H.P.
and the same range of sizes also available with 3 to 1 reduction gear.

N.Z. Factory Representatives:
F. W. CAVE LTD.,
P.O. Box 1685 - - - - - - Auckland.



★ added constructional advances that mean maximum tyre performance in the worst conditions

DUNLOP
NEW ZEALAND
LIMITED

DUNLOP
FARM TRACTOR TYRES

Ask the man who uses Dunlop!

DTT.1.9

The New Scientific rat killer that

KILLS AT A TOUCH

Sprinkle RANTU around rat holes and runways . . . the rat picks up the dust, licks his feet and dies within 12 or 48 hours, usually outdoors. 100% effective. This special preparation of Alpha Naphthyl Thiourea is now available at all stores in 3oz tins or larger sizes.

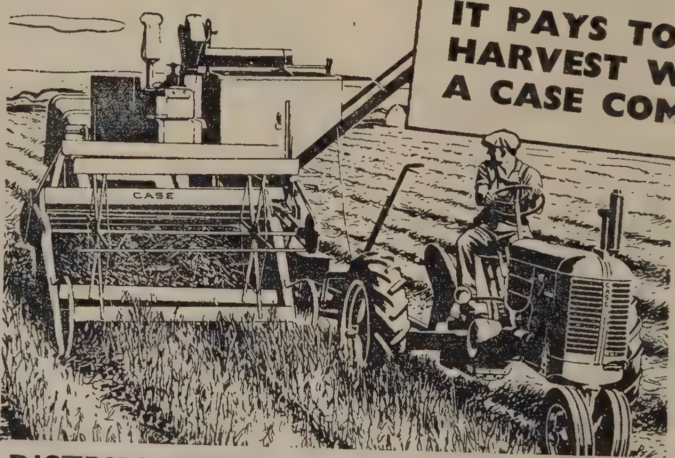
ASHE

Distributors: T. A. MACALISTER LTD.,
12 Albert St., Auckland.

SAVES ALL SEEDS

4870.9

IT PAYS TO HARVEST WITH A CASE COMBINE



DISTRIBUTORS:
John Chambers & Son Ltd., Sole N.Z. Agents. Auckland, Wellington, Christchurch, Dunedin, Invercargill, Timaru, Hamilton, Palmerston North, New Plymouth, Ashburton, Nelson.

CASE

Whatever crops you grow, from small grains to tiny clover and fluffy grass seeds, there is one combine that will do a superb job of saving them at harvest time. That is the 6-foot Model "A" Case Combine — proved all over the world in more than 100 different crops — built to get every last possible kernel and to get *it clean.* Ask your Case distributor.

The Home Garden in January

By C. L. NAPIER, Horticultural Instructor,
Department of Agriculture, Hastings

A WELL-PLANNED garden should be supplying the home gardener with a variety of produce during January. All main sowings and plantings should have been completed by this month, but small sowings of peas, beans, carrots, and lettuce, among other crops, can still be made. Last month suggestions were made for provision of winter crops. Although main plantings will have been made by now, it is not yet too late to supplement these by planting up plots cleared of summer crops. Any plots from which summer crops have been harvested and which are not required for winter plantings should be sown down to a green crop such as lupin, mustard, barley, or a vetch.

[*Green and Hahn Photography Ltd. photo.*

JANUARY is the time when many look back, review their past activities, and make resolutions for the coming year. As this month can be taken as the time of change-over from summer to winter crops in some districts, gardeners may do well to review their activities in the vegetable garden so that they can improve their future seasonal operations.

There is no doubt that home vegetable production is important in the life of a family. Home-produced vegetables are usually superior in flavour to those purchased, partly because marketed products are often harvested earlier than home garden produce and are in an immature condition when purchased. Home-produced vegetables are also often higher in food value, because they are in a fresher condition than those marketed.

BELOW: Early potatoes should be dug carefully and as they are required; they tend to deteriorate in storage.
[*R. W. Orr photo.*

The home garden can provide desirable kinds of vegetables that often are not found on the market. It should produce throughout the year, particularly during winter, when shop supplies of vegetables are short and some types are unobtainable. Apart from its value from the family economy and health aspects, gardening provides a pleasant form of relaxation, particularly for those in the more sedentary occupations.

Garden Planning

Planning should decide what vegetables are to be grown each season and what quantity of each is to be provided for the family. The kinds to grow will of course depend largely on the district, but garden size also must be considered. For instance, it may not be advisable to grow crops such as pumpkins and corn where land is restricted.

Where there is a great surplus of any particular vegetable in any year the gardener should reduce sowings in the following season and use the space saved to extend the sowing of another vegetable which was not grown in sufficient quantity. It is better to plant larger quantities of winter vegetables than of summer ones.

The likelihood of a surplus of "softer" vegetables like salad crops can be reduced by making successional sowings instead of one large one. Smaller sowings allow the gardener with only a small plot to raise a greater variety. Distances between rows and plants may be decreased where convenient, but manuring will need to be increased to support the increased crop. Interplanting will also assist in producing the maximum from a small area.

The number in the family will be one of the main factors influencing the home gardener's decision as to the quantity of each crop to be grown. For example, it would be foolish to use most of the plot for such a crop as spinach when a large family has to be fed, since a big proportion of the total production for the area would be used for one meal. Rows planted to silver beet or another more economical green would prove a much sounder proposition. In estimating the requirements for his family the gardener may find the following approximate yields per 100ft. of row of some assistance:—

	lb.		
		Leeks	150-200 plants
Broad beans	120-200	Lettuce	100-130 heads
Other beans	60-80	Marrow	100-200 fruits
Cabbage	150-200	Onions	100-150lb.
Beetroot	70-100	Parsnip	160-200lb.
Carrot	75-100	Peas	120-160lb.
Cauliflower	120-150	Pumpkins	100-200 fruits
Potatoes	150-200		
Silver beet	80-150	Tomatoes	150-200lb.
Swedes	180-200	Turnips	75-100lb.

To obtain the maximum benefit from the land available some system of crop rotation should be practised. This will ensure that the soil is not being depleted of any one plant food more than another and will also assist in keeping soil-inhabiting pests and fungi to a minimum. Continuity of supply is an important aspect in any garden. Most gardens produce crops in spring and summer, when gardeners find work comparatively easy and pleasant. The gardener should endeavour to plant so that even in winter he will have available at least half a dozen main vegetables. Summer crops are less important than winter ones, as they are normally more plentiful and cheaper to purchase.

In planning his garden the gardener should endeavour to grow all of his quick-growing crops in a plot separate from his slower-growing ones. Potatoes, onions, and winter roots, for instance, are best set aside from spring carrots, lettuces, and spinach. If plots

Surest and Best way to combat *Mammitis*

MANNINGS PENICILLIN UDDER INJECTION

MANNINGS
PENICILLIN
udder injection

The quick, easy and effective way to deal with Mammitis is to give immediate injections of MANNINGS PENICILLIN. Keep **your** herd Mammitis-free with this proved treatment in the original single-squeeze tube.

Always have on hand

MANNINGS
PENICILLIN
udder injection

Obtainable throughout New Zealand.

Farm proved—and backed by the 60 years' veterinary experience of MANNINGS LTD., HAMILTON.

M8.6

NUFFIELD
The
NUFFIELD
UNIVERSAL
FARM
TRACTOR

Britain's Newest aid to Tractor Powered Farming

N.Z. Distributors:
THE DOMINION MOTORS LTD.,
P.O. Box 590, Wellington.
Representing: NUFFIELD EXPORTS LTD.
(Chairman: Viscount Nuffield)

PREFABRICATED BUILDINGS

EASY TO ERECT YOURSELF

SIZES: 10ft. x 10ft., 10ft. x 20ft., 10ft. x 30ft. etc.
20ft. x 20ft., 20ft. x 30ft., 20ft. x 40ft. etc.

CURVED ROOF PREFABRICATED BUILDINGS ALSO AVAILABLE.

Suitable for Workers' Accommodation, Halls, Stores, Offices, Baches, Workshops, etc.

Inexpensive, attractive NEW materials.

WRITE TO:

BARR-BROWNS LIMITED
49 GRACEFIELD ROAD -- LOWER HUTT.

[*R. W. Orr photos.*

Left—Production nil. Right—This garden is full of produce, with plots cleared of summer vegetables planted up to winter crops. The border in the foreground has been used for rhubarb, herbs, and seedling beds.

are not required for replanting after the removal of the quick-growing vegetables, they can then be sown to a green crop for digging in. Herbs, rhubarb, asparagus, and other perennials should be grown in their own particular plots. They do not then interfere with seasonal cultivation practices. If raised near a path or in a narrow border, salad crops are easily accessible to the housewife, and being comparatively quick growing do not take up valuable space for a long period.

Gardens planned on slopes may be best with rows round the contours and not up and down the hill. It is then much easier to move about when cultivating and irrigation can be done more efficiently.

Gardeners should not omit to provide shelter where necessary, and planning ahead now will allow early placing of orders for the desired plants. A selection should be made from those hedges and shelter trees which have already proved successful in the district.

Selection of Kinds and Varieties

To plan efficiently a gardener must consider the kinds and varieties of vegetables to grow. Consideration should be given to the purposes for which the vegetables will be required, whether for drying (peas and beans), processing (tomatoes, green beans, and peas), fresh storage (root crops, tubers, swedes), or, as with the leaf crops, to be left standing in the garden for winter. Most of these vegetables are essential and are heavy producers. Although pumpkins and other vines produce fairly heavily in suitable districts, they take up a relatively large amount of valuable space that might otherwise be utilised to greater advantage.

Not every district is suitable for growing all kinds of vegetables and for this reason each should be considered on its merits. Gardeners in districts which experience dry, hot winds in summer may have flower drop troubles on tomatoes and beans for instance, or if the summers are wet, fungous diseases may develop on vines and beans, and cracks on tomatoes. Experience will prove whether or not it is economical to grow these crops.

Varieties too differ in their climatic requirements and should be chosen to suit local conditions.

The following vegetables do better in temperatures below 70 degrees F.: Cabbage, brussels sprouts, broccoli, kale, beetroot, turnips, spinach, leeks, and parsnips. The following also stand cool conditions but are generally less hardy than the above: Broad beans, lettuce, onions, peas, carrots, and cauliflowers. Potatoes, tomatoes, kumaras, cucumbers, pumpkins, melons, beans, corn, and asparagus are frost tender and do better in temperatures about 70 degrees F., provided of course that moisture is adequate.

Most home gardeners are aware that lettuce breeders have selected some types suited especially for summer and others for winter production. Quick-maturing carrots especially suitable for spring and autumn sowing and cauliflowers more suitable for winter than for summer production are obtainable. Cabbages and potatoes are also good illustrations of vegetables where correct varietal selection will make an enormous difference to ultimate yields. Varieties suitable for all main New Zealand districts are listed with other useful information in a handy leaflet obtainable from offices of the Department of Agriculture and seedsmen who are members of the Horticultural Seedsmen's Association.

Soil Improvement

No amount of work in the garden whether it be disease or pest control, cultivating, or manuring will ensure good crops if soil conditions are not satisfactory. Poor soil conditions are responsible for more failures than many gardeners realise. If failures not attributable to pests or poor seed have been experienced, it would be advisable to try to determine if something is lacking in the soil. Soil-improvement measures include the addition of organic matter and manures, drainage, trenching to deepen the topsoil, liming to improve texture, irrigation, and, occasionally, soil sterilisation.

Manuring contributes to soil improvement and is often necessary even though green crops or other forms of organic matter may have been used. A green crop grown on soil deficient in major or minor plant foods will not always improve the supply of these elements. When fertiliser is being applied the quantities should be on the generous side and sufficient to ensure improvement. Light sprinklings of fertiliser are ineffective and wasteful. Gardeners should remember that if continual and satisfactory crops are to be expected each year, at least the equivalent of plant foods removed in crops should be returned.

Of course over-zealousness in the application of manures or fertilisers can lead to a variety of troubles. Too much fresh animal manure, particularly close to sowing or planting, can reduce germination or cause death of plants. Fertilisers applied close to seeds or in too great a quantity can also cause losses. More detailed discussions on soil improvement and manuring for gardeners were given in the "Journals" for March, May, and November 1952.

Seed Sowing and Planting

If good germination is to be expected, sowing seeds under the best possible conditions is necessary. Fresh, viable seed should be sown where possible. Poor germination can often be attributed to one of the following causes: 1, old or immature seed; 2, dry, wet, or cold soil conditions; or 3, sowing too shallow or too deep. Treatment of seed with a protectant dust to reduce attacks by soil-borne fungi is recommended.

Failures after transplanting are sometimes due to delay between lifting from the seed-bed and replanting. Losses can also result when the plants have not been planted firmly. Sowing and planting of most summer varieties

BANK of NEW ZEALAND

"My Bank"

to thousands of Farmers

When the farmer says, "I'm calling on my bank" he more often than not means the Bank of New Zealand. As the largest banking business in the Dominion, the B.N.Z. offers the farmer unrivalled banking facilities with helpful counsel based on a sound knowledge of local conditions. Your enquiries are invited.

BANK OF NEW ZEALAND

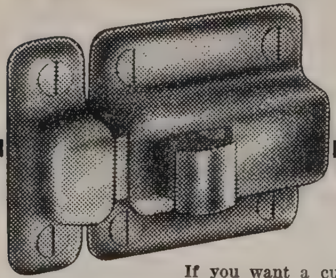
More than 290 Branches and Agencies in the Dominion. Established 1861.

18.IC

OVER

One Million

PALLO CUPBOARD CATCHES IN USE IN NEW ZEALAND



If you want a cupboard catch that will stand up to wear and rough treatment and still maintain its good looks and efficiency, turn to **PALLO.** After years of continual improvement the **Pallo Cupboard Catch,** with its fine quality chromium finish, is as sturdy and reliable as continual cupboard use demands.

PALLO

Cupboard Catches

are available from all Hardware Merchants and Builders' Suppliers.

Manufactured by Pallo Engineering Ltd., Wellington.

TO *England* FOR THE **CORONATION**

FOR ALL TRAVEL REQUIREMENTS

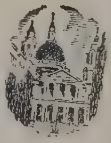
UNION LINE
BOOKING SERVICE

UNION STEAM SHIP CO. OF N.Z. LTD.

Travel to anywhere . . . the Union Line can book you on the World's main travel services, by sea, by air, by land.
Enquire now for full particulars.

(Agents all principal Airlines).

Reserve now for



CORONATION TOURS TO UNITED KINGDOM

AUSTRALIAN TOURS including special Melbourne Cup and Queensland Tours

SUNSHINE TOURS TO FIJI & NORFOLK ISLAND

too early in the season often does not prove of advantage, as later plantings usually come away much better and losses are fewer. Detailed information on sowing, planting, and seed treatment was given in the June and July issues of the "Journal".

Diseases and Pests

Attacks by pests and diseases probably cause more failures or at least give greater reductions in crops than all other factors. Many gardeners attribute the failure of their crops solely to poor soil conditions. Although this may be the cause sometimes, usually a disease or pest is responsible. Some pests can cause total loss of crops, and if attacks develop late in the season, it may be too late to replant that crop.

Close examination is often necessary to determine whether a disease or pest is responsible for poor growth. In dry weather a watch should be kept for attacks of pests such as caterpillars, aphides, and thrips. When conditions are cool and damp some fungi such as grey mould may be troublesome, and in warm, moist conditions late blight may appear. Apparently unaccountable lack of growth or death of plants may have been due to attacks by soil pests or fungi.

In districts where particular pests or diseases tend to be troublesome regular preventive sprays are necessary if losses are to be reduced. If the gardener does not take precautions, he will find he needs to grow more to allow for losses.

Articles on pests and diseases and their control appeared in the home garden notes in the September and October 1952 issues of the "Journal".

Winter Crops

Vegetables for winter consumption often require a great deal of attention during their growing period if they are to be over-wintered successfully. Poor keeping quality in vegetables is often attributable to too-early harvesting. Onions, pumpkins, and potatoes are specific crops which will not stand winter storage if harvested when immature. Poor growing conditions (too much moisture during the normal "ripening" period) will also give bad storage quality.

This garden is being utilised to the maximum with lettuces (quick-maturing vegetables) growing between rows of leeks and parsnips.

Losses in the field may be incurred through poor over-wintering conditions. Root crops rot in the soil if it is too wet. Onions, cucurbits, and potatoes must be stored in dry, cool conditions for best results. Winter greens should be grown on the highest spot in the garden so that excessive winter moisture does not cause damage.

Storage of vegetables was discussed in the home garden notes in the February 1952 issue of the "Journal".

[*Green and Hahn Photography Ltd. photo.*

Good planning will include utilisation of unsightly rubbish corners as illustrated.

Garden Hygiene

Failure to practise satisfactory garden hygiene can lead to several troubles. All weed growth should be eliminated, as weeds compete with crops for moisture and food and if left undisturbed, can check considerably the growth of plants. Weeds also act as hosts for some vegetable diseases and pests which can later transfer to cultivated crops; virus diseases, fungi, aphides, snails, and the green vegetable bug are a few examples.

An untidy garden is unpleasant to work in and makes gardening seem more difficult. All edges should be kept tidy, hedges trimmed, and the tool shed made neat and tidy. Garden tasks will be done more thoroughly and easily if tools are kept clean and sharp. Although an untidy garden may produce a full range of vegetables, a neat one is more pleasant and will be a source of pride.

Keeping a Diary

Garden diaries are overlooked by most gardeners, but they can be important in the efficient running of a home garden and many find them indispensable. Weekly entries probably will be sufficient. Entries should include notes on sowing and planting dates, varieties, manures used, the weather, and harvesting dates. Reference to a diary may clarify an uncertain memory and remind the gardener to vary such factors as sowing dates or manurial practices.

The diary can also include a small sketch of sowings or plantings where more than one variety of a vegetable is sown. This will act as a check if labels are lost and varieties are forgotten. Strength of sprays used should be recorded, as these may later be useful if results have been poor or detrimental to the plants.

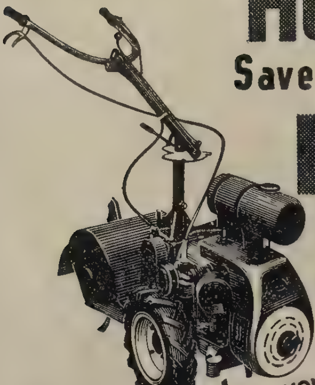
A diary should also contain information such as tables of weights and measures. Tables to assist in mixing

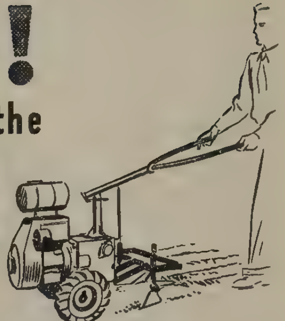
HOME GARDENERS !

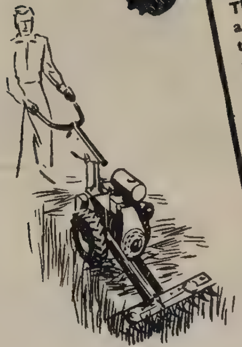
Save yourself work over the weekend with the

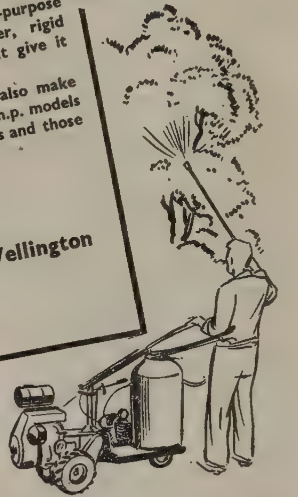
MONROTILLER

England's finest Midget Rotary Cultivator









The MONROTILLER brings "large area" mechanisation to home gardeners, practically eliminating the need for hand digging and cultivating, and achieving greater results. Small, compact and powerful, it is inexpensive to own and operate, yet has been built to a standard and not to a price.

This machine is also widely used by commercial growers mainly for inter-row cultivation.

DOES OTHER WORK, TOO !

The MONROTILLER is not just a one-purpose machine—a really efficient sickle mower, rigid cultivators, compressor and spraying unit give it work at any time of the year.

The manufacturers of the Monrotiller also make the well-known ROTOTILLER 5 and 8 h.p. models which will interest commercial growers and those with large areas under cultivation.

N.Z. Distributors :

Ivory Bros. Ltd. Wellington

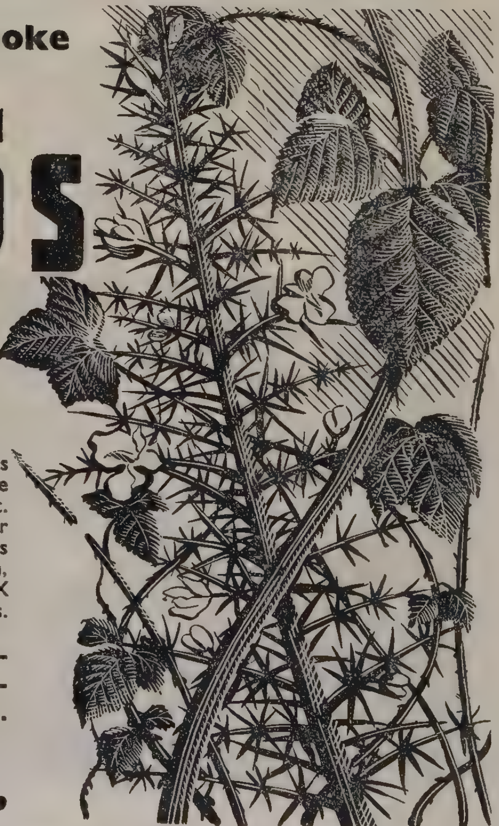
P.O. Box 1321

Branches and Agents throughout New Zealand

don't let BLACKBERRY and GORSE choke profit-land . . . spray with

stantox T-45s

PROVEN! the most economical and concentrated weed-killer on the market . . .



G52.52.12

stantox
T45S
SCRUB KILLER

Blackberry and Gorse wasteland is a luxury you can do without easily. STANTOX T.45S is a highly concentrated 2,4,5-T weed-killer (acid equivalent 3.6 lbs./1 gallon) which kills these and other pests without back-breaking labour. STANTOX T.45S is the most economical concentrated spray on the market. Used with STANTOX spray equipment you can clear ditches, pastures, fence rows of scrub and herbaceous plants. If Blackberry, Gorse, Lupin, Briar, Broom, Poison Ivy etc. are a problem see your STANTOX distributor—*now* is the time to spray for best results.

This is a 2,4,5-T HORMONE WEED-KILLER PREPARED TO KILL EFFECTIVELY BLACKBERRY AND GORSE.

MANUFACTURED BY

J. H. BARBOUR & SON LTD.,

86 WAKEFIELD STREET, WELLINGTON.

sprays were given in the home garden notes in the September and October 1952 issues of the "Journal". Those given in the panel below may also be useful.

Work for January

Gardeners will probably find gardens heavily infested with weeds when they return from holidays and weed growth should be eliminated as soon as possible so that valuable moisture is conserved for crops. Mature crops of vegetables such as peas, beans, and tomatoes should be harvested and all crops showing attacks from pests and diseases sprayed to check their spread.

Measuring Small Quantities of Fertilisers

Level Tablespoons of Fertiliser per oz. (approx.)

Bone meal	3½
Blood and bone	4
Lime (hydrated)	3 + 1 teaspoon
Lime (crushed)	2½
Sulphate of ammonia	2½
Sulphate of potash	3½
Muriate of potash	4
Nitrate of soda	2
Superphosphate	3

Fertiliser Applications

7½oz. per sq. yd. = 1 ton per acre
1oz. per sq. yd. = 3cwt. (approx.) per acre
1oz. per 12 lineal feet = 1cwt. per acre (rows 2ft. apart)
1oz. per 9½ lineal feet = 1cwt. per acre (rows 2½ft. apart)
1oz. per 8 lineal feet = 1cwt. per acre (rows 3ft. apart)

Sundry

1 acre = 208ft. × 208ft.
1/16 acre = 45ft. × 65ft. (approx.)
1 bushel (volume) = 12in. × 12in. × 15½in.
A full-sized apple case is a convenient bushel measure.

Crops affected by lack of moisture should be watered copiously, particularly vine and leaf crops. Mulches can be placed about tomatoes, beans, peas, and celery, provided the soil is moist.

Kumara vines should be lifted to prevent them from rooting and tubers should be kept covered with soil. Potatoes will probably need earthing up to prevent entry of the tuber moth larvae.

Lettuces, silver beet, and other leaf crops should be treated with liquid manure or a quick-acting fertiliser like sulphate of ammonia to encourage leaf production or hearting. Depending on growth, other vegetables such as tomatoes and root crops may benefit from side dressings of fertilisers.

Sowings of crops made last month and earlier should be thinned out where necessary. Seedling beetroot, silver beet, and lettuce can all be transplanted from thinnings if they are lifted carefully. Tall tomatoes should be pruned of side shoots when necessary and tied securely, but loosely around the stems, to their supports. Foliage other than side shoots should not be removed from plants, as this may cause the fruit to become sunburnt.

Asparagus and rhubarb beds after being turned over and cleared of perennial weeds will benefit from a liberal mulching or manuring.

Harvesting

Harvesting of pod crops such as peas and beans should be done regularly, as this lengthens the cropping period. If left on the plant too long, the fruits become over-mature and unappetising.

[*Green and Hahn Photography Ltd. photo.*

In larger gardens corn and other tall crops provide valuable shelter, but should not shade shorter crops.

[*Sparrow Industrial Pictures Ltd. photo.*

Pod crops such as peas and beans should be harvested regularly, as this lengthens the cropping period. The peas shown are the tall variety Alderman.

Early potatoes should be harvested carefully to avoid damage to tubers. Early and immature tubers do not keep well and for this reason are best left in the ground until required.

Tomatoes should be picked as they mature; otherwise birds may damage the softening fruit, and too great a number of near-mature fruits on plants tends to check their growth and also their productive life.

Marrows are best cut as soon as they are 12 to 18in. long if plants are expected to produce crops for a fairly long period. Cucumbers are best cut when slightly immature and care should be taken not to damage the vines.

As early-maturing onions begin to brown off the tops can be turned over to hasten ripening. When the tops have withered the bulbs can be lifted and left on the soil for the roots to die off. Mature shallots should also be lifted carefully and dried off thoroughly before separation and storage.

Sowing and Planting

Sowing of a number of summer crops can still be done, provided water can be used later in dry districts. Salad crops such as mustard and cress, radish, and lettuce can be sown, all in beds except the last, which is best sown in rows. "Spring" onions can also be sown conveniently in a bed in an odd corner of the garden. Endive, a good substitute for lettuce, can be sown in situ and later thinned. Endive culture is similar to that for lettuce except that endive unless blanched should be used when immature.

Root crops that can still be sown include carrots (early, quick-maturing varieties), particularly in districts with mild autumns, parsnips (stump-rooted varieties), beetroot (Crimson Globe), swedes (preferably in districts with long, mild autumns), and turnips (Golden Ball).

Pod crops: It is not too late to make a sowing of a quick-maturing pea variety, but in the colder districts sowings must be made immediately. Earlicrop, William Massey, and Little Marvel are suitable varieties. Dwarf beans (The Prince or Canadian Wonder) will reach maturity, provided frosts are not experienced early. Climbing beans can also be sown, but the autumn must be reasonably mild if this type is to reach maturity.

Winter crops: It is not too late to make provisions for the important winter vegetables. Kohl rabi, New Zealand spinach, and silver beet can all be sown.

Seedlings of broccoli (see last month's notes for varieties), brussels sprouts, curly kale, cauliflower, savoy and red cabbage, spinach, and silver beet should be set out.

Leeks can be set out in trenches or dibble holes made in enriched soil, and celery should be set either in trenches or in small beds with plants about 8 to 12in. each way to promote blanching when the foliage meets.

In colder districts the first sowing of spring cabbage can be made later in the month. Recommended varieties are Flower of Spring and Enfield Market.

◆

Effect of Blockage of Low-volume Sprayer

ON fertile country in dairying districts annual buttercups have in the past caused a considerable amount of trouble in pastures and loss of production, but now with the use of hormone weedkillers annual buttercups are not the worry they used to be. Low-volume spray equipment can be purchased and assembled by the average farmer, and with care it can be used successfully for pasture weed control. (Low-volume sprayers are extensively dealt with in two articles by C. J. Crosbie, Machinery Instructor, Department of Agriculture, Christchurch, which appeared in the September and October 1951 issues of the "Journal".)

Low-volume nozzles are designed to give a fine spray of even particle size at pressures as low as 20 to 30lb. per square inch. The orifice diameter of such nozzles is in the region of 20 thousandths of an inch for the smaller sizes, which discharge at rates as low as 1 gallon per acre. The average amount applied by low-volume sprayers is about 8 gallons per acre, which is a remarkably small quantity to cover such a large area.

Any particles of dirt passing through the system must cause trouble. Even where care is taken there is always a chance that nozzles may become blocked. The accompanying illustration shows quite well the effects of a blocked nozzle. The rows of flowering annual buttercups indicate what the whole field would have been like had no attempt been made to spray.

Therefore blocked nozzles should be watched for and the cause removed whether it is faulty gauzes or some source of foreign matter.

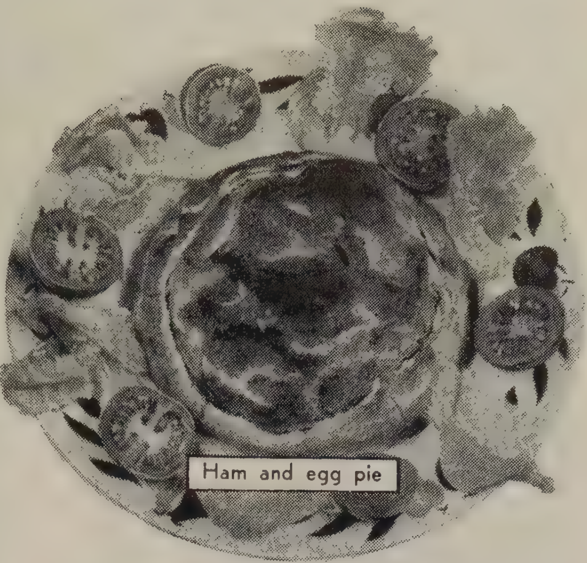
—*J. R. MURRAY,*
Instructor in Agriculture,
Department of Agriculture,
Hamilton

Meteorological Records for October

Station	Height of station above M.S.L. (ft.)	Air temperatures in degrees (Fahrenheit)				Rainfall in inches					Bright sunshine hours
		Approx. mean	Difference from normal	Absolute maximum and minimum		Total fall	No. of days of rain	Difference from normal	Maximum fall		
				Maximum	Minimum				Amount	Date	
Kerikeri	201	58.2	+ 1.4	76.0	41.8	4.75	16	+ 0.24	1.31	14	175.7
Auckland	160	59.0	+ 1.6	71.3	45.3	3.92	14	− 0.17	0.90	4	185.9
Tauranga	10	56.3	+ 0.3	72.2	39.4	10.51	15	+ 5.54	5.10	27	208.1
Ruakura	131	54.4	+ 0.1	70.7	34.1	5.10	15	+ 0.97	1.32	7	170.1
Rotorua	960	54.6	+ 1.6	70.5	35.8	5.69	14	+ 0.53	1.40	7	183.7
Gisborne	12	57.0	+ 1.0	77.9	34.3	1.40	12	− 1.03	0.34	28	221.3
New Plymouth ..	160	55.6	+ 1.2	68.0	40.2	5.27	14	− 0.36	0.93	31	179.4
Napier	5	57.2	+ 0.7	76.0	38.3	2.73	10	+ 0.83	1.41	7	201.4
Karioi	2125	50.0	+ 1.8	74.0	30.0	3.44	14	− 0.81	0.79	31	
Wanganui	72	57.0	+ 2.2	73.8	40.0	1.63	9	− 1.59	0.43	19	199.1
Palmerston North .	110	56.1	+ 2.2	72.0	40.0	2.57	10	− 0.99	0.40	4, 31	164.1
Waingawa	350	54.6	+ 1.9	75.0	33.5	2.92	9	− 0.04	0.64	19	210.2
Wellington	415	54.4	+ 1.6	65.6	41.6	4.73	12	+ 0.50	1.88	19	201.9
Nelson	5	54.0	+ 1.8	69.0	35.4	2.42	11	− 0.94	0.80	19	227.2
Blenheim	12	55.6	+ 1.4	74.2	36.8	2.07	11	− 0.13	0.72	19	239.3
Hokitika	12	52.2	+ 1.2	65.9	36.7	9.07	21	− 1.95	1.60	18	130.3
Hanmer	1225	51.9	+ 1.3	76.5	29.0	4.13	13	+ 0.23	1.84	19	171.3
Christchurch ..	22	54.0	+ 0.9	77.0	38.0	3.18	10	+ 1.23	0.96	19	162.8
Ashburton	323	54.6	+ 2.2	80.4	35.4	4.81	14	+ 2.39	1.40	20	149.1
Timaru	56	53.8	+ 1.1	76.5	32.0	4.09	9	+ 2.16	1.40	12	153.0
Alexandra	520	54.6	+ 2.2	77.7	32.2	3.65	12	+ 2.43	1.37	18	178.7
Taieri	80	51.7	+ 0.6	80.3	30.9	2.78	18	+ 0.72	0.99	18	145.1
Invercargill ..	0	50.9	+ 1.9	72.3	31.1	5.40	20	+ 1.92	1.19	1	153.8

Tea Dishes Can be Prepared in Advance

A SATISFYING meal requiring the minimum of preparation is often required at short notice. In some homes the unexpected is coped with by having a stock of commercially prepared goods which can be made quickly into an appetising meal. No fault can be found with this. It is, however, a rather different set of circumstances, when some state of emergency can be foreseen, that is dealt with in this article by Maud B. Strain, Field Officer in Rural Sociology, Department of Agriculture, Dunedin.


Ham and egg pie

SUCH a situation arises when the housewife finds it necessary to be away from home all day and wishes to leave something that will need little preparation on her return or that the family can prepare quickly during her absence. There is also the home where friends are welcome at any time without warning. Dishes which can be made a day or two beforehand and eaten cold are an easy solution and in summer would be quite acceptable. However, something hot seems to have a more widespread appeal and with this in mind a few recipes have been chosen which need only heating up, browning in the oven, or frying in deep fat.

Deep-fat frying is a straightforward method of cooking and gives a greater chance of success to inexperienced cooks than the more commonly used shallow frying. Also the greater ease in controlling the cooking temperature in the larger volume of fat leads to more uniform results.

A saucepan with a fairly thick base is advisable, and it should not be more than half-full of fat to allow for the spluttering that always occurs when moist food is lowered into hot fat. A frying basket is a great convenience for lowering the food into the hot fat and lifting it out again, but it is not essential; a slotted or perforated cooking spoon can be used instead. To prevent the fat from penetrating during cooking most foods need to be coated with either batter or egg and breadcrumbs before frying. The coated food is lowered gently into the fat a medium amount at a time or the fat will be cooled too much. The cooking time varies from 2 minutes for croquettes, etc., to 8 minutes for potato chips. The food is lifted out of the fat, held for a moment to drain, and then placed on absorbent paper. It should be free from fat when served.

The temperature of the fat may be judged by testing with 1in. cubes of stale bread and noting the time taken to become golden brown. The following are examples: 60 to 70 seconds is hot enough for uncooked mixtures (350 to 370 degrees F.); 40 to 50 seconds is hot enough for cooked mixtures (365 to 380 degrees F.); 30 to 40 seconds is hot enough for moist cold foods (380 to 390 degrees F.).

Cotton-seed oil is excellent for frying, but is often difficult to obtain. Dripping collected from the family roasts is entirely satisfactory provided it is clean and free from salt.

Short Pastry

4oz. of fat
8oz. of flour
Water to mix
½ level teaspoon of salt

Rub the fat lightly into the flour with the tips of the fingers and thumbs until the mixture looks like fine breadcrumbs. With a knife mix in the least possible amount of cold water to make a stiff dough. Flour the pastry board and rolling pin very lightly. Roll out the pastry and handle it as little as possible. Bake in a hot oven at 450 degrees F.

Pastry may be made several days before it is to be used. It will keep satisfactorily if wrapped in waxed paper and stored in a cold place.

Medley Pie

2lb. of apples
6oz. of bacon
1 small onion
2oz. of sugar
2 level teaspoons of mixed spice
Short pastry

Prepare sufficient apples (as for apple pie) to fill a pie-dish. Prepare the onion and cut up finely. Remove the rind from the bacon and cut the bacon into small pieces. Put all together in a basin. Add the sugar and mixed spice and mix all well together. In the bottom of the pie-dish put 1 tablespoon of water and then transfer the well-mixed ingredients from the basin back to the pie-dish. Cover with short pastry. Bake at 450 degrees F. until pastry is golden and apples soft.

When required this may be heated by standing it in boiling water in a roasting pan on top of the range for ½ hour and then transferring it to the oven for a few minutes to crispen the pastry before serving.

Cheese Pie

4oz. of grated cheese
½oz. of melted butter
2 eggs
½ pint of new milk
Short pastry
Level teaspoon of salt
Shake of cayenne pepper

Grate the cheese finely. Beat the eggs and add milk, salt, cayenne pepper, and melted butter. Line a pie-dish with short pastry. Pour in the custard mixture and bake at 450 degrees F. for first 10 minutes and then reduce temperature to 400 degrees F. (Total time 25 minutes.)

Ham and Egg Pie

1lb. of ham end or lean bacon
3 or 4 eggs
Pepper, few shakes
Short pastry

Line a pie plate or sandwich tin with short pastry. Cut rind from bacon. Put bacon in basin and pour boiling water over it, allowing it to stand for a few minutes. Pour off water and cut bacon up small or put it through a mincer. Spread minced bacon in the pastry-lined tin and break eggs on top, pricking yolks so that they will spread. Cover with pastry and bake at 450 degrees F. about 30 minutes.

Curried Eggs

1oz. of butter
2 onions (small)
2 apples
1 level tablespoon of curry powder
1 tablespoon of vinegar
½ pint of stock, or water
Salt and pepper to taste
1oz. of flour
6 eggs (hard boiled)
1 teaspoon of sugar

Melt the butter in a saucepan and fry the onions lightly in the butter till golden. Mix vinegar, sugar, curry powder, and cut-up apples in a basin and add the stock. Add this to the onion in the saucepan and cook for 20 minutes. Mix the flour, pepper, and salt with a little water and add it to the ingredients in the saucepan, stirring all the time till it boils. Allow this sauce to cook for 10 minutes. Hard boil the eggs and then shell and slice them on to warmed plates. Pour the hot sauce over them and serve at once.

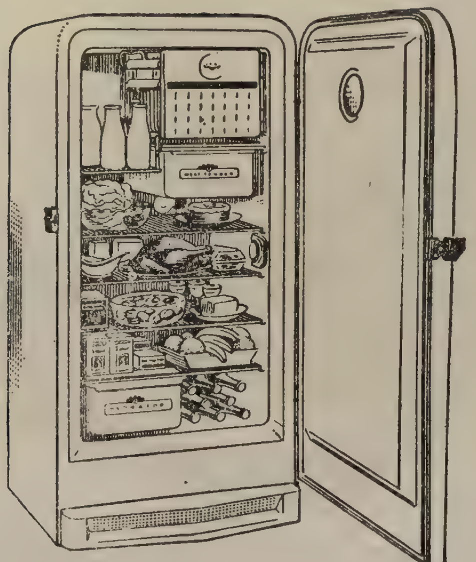
This sauce can be made in advance and reheated when required, while the eggs are being cooked.

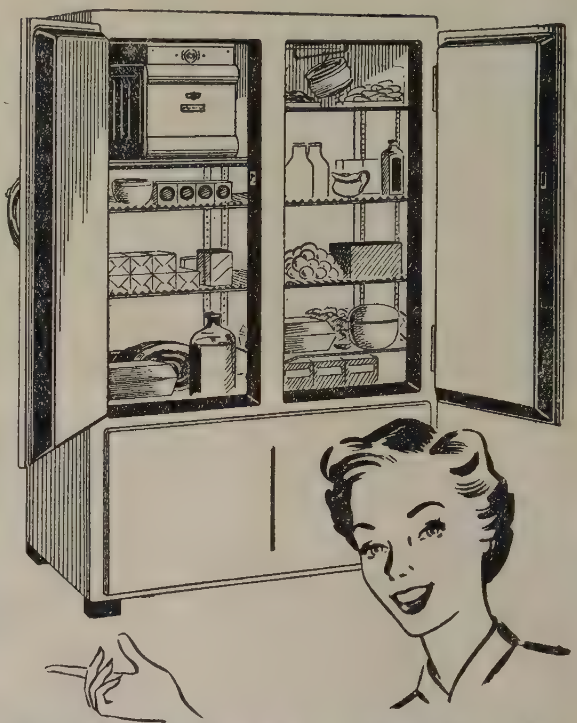
Egg Cutlets

6 eggs (hard boiled)
2oz. of butter
2oz. of flour
½ pint of milk
Salt and pepper
1½ level teaspoons of curry powder
½ teaspoon of lemon juice

Melt butter in saucepan, add flour and curry powder, and cook for a minute; then add the milk, stirring until the mixture leaves the sides of the pan. Chop the eggs and add to the mixture together with the salt, pepper, and lemon juice. When the mixture is cold shape into cutlets and dip first in egg and then in fine breadcrumbs. Fry in shallow or deep fat till golden brown. Serve hot. (365 degrees to 380 degrees F. for 2 to 3 minutes.)

The cutlets can be made when convenient beforehand and cooked when required.





HERE'S MORE FOR YOUR MONEY WITH WORLD FAMOUS FRIGIDAIRE

REGISTERED TRADE MARK

the 7·4 cu. ft. FRIGIDAIRE

For normal or large family needs 7.4 cu. ft. model FRIGIDAIRE is ideal. Note the full depth door that means more *inside USABLE* space with less outside size—that's a big feature in modern kitchens. Now look inside at the *extra* large Super-Freezer—the temperature control on the side and of course the other features are MEAT STORAGE COMPARTMENT—VEGETABLE STORAGE—"QUICKUBE" ICE TRAYS. The working heart of this model is the WORLD FAMOUS "METER-MISER", the most economical, dependable cold-making mechanism ever made, and it's exclusive to FRIGIDAIRE.

the 18 cu. ft FRIGIDAIRE

On farms where extra cold storage space is wanted, the 18 cu. ft. FRIGIDAIRE is the answer. Its big double doors put everything in easy reach and it has all the new, *plus* features that have made FRIGIDAIRE the world's *biggest seller!* Look what you get:—LARGE SUPER FREEZER—ADJUSTABLE SHELVES—CONVENIENT MEAT RAIL—ADJUSTABLE COLD CONTROL—"QUICKUBE" ICE TRAYS—GENUINE FRIGIDAIRE TWO CYLINDER VALVE-IN-HEAD COMPRESSOR BODY.

See your nearest Frigidaire dealer for further details.

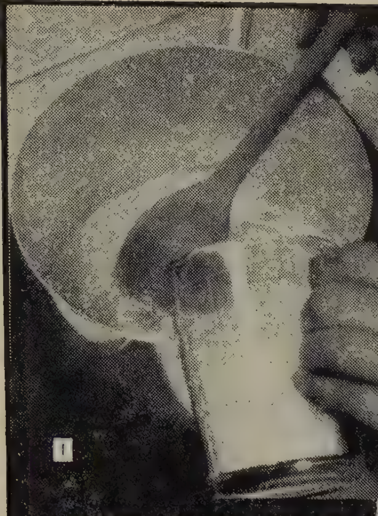
Distributed by

FRIGIDAIRE DIVISION OF GENERAL MOTORS NEW ZEALAND LIMITED

Through a New Zealand-Wide Network of Authorised Frigidaire Dealers

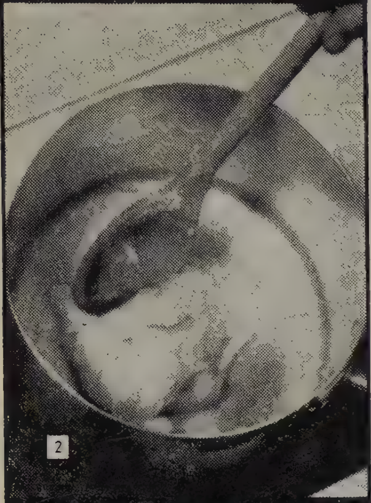
G5119.24

Cheese aigrettes with bacon



1

Add flour all at the same time to the hot water and butter.



2

Stir over heat until mixture leaves sides of pan.

3

Remove from heat and add well-beaten yolks, one at a time.

Cheese Aigrettes

3oz. of grated cheese
4oz. of flour
2oz. of butter
3 eggs
½ pint of boiling water
Salt
Cayenne pepper

Put butter and water into a small saucepan, stir in all the flour at once over the fire, and stir till the mixture leaves the side of the pan. Take the saucepan off the fire and add the yolks of eggs one at a time and beat the mixture till it looks smooth and shiny. Add cheese and seasoning, and stir in the stiffly whipped whites. When the mixture is cold fry in teaspoonfuls in deep fat. Serve hot or cold (365 to 380 degrees F. for 2 to 3 minutes).

This mixture can be made several days in advance. It is then ready for frying in deep fat when required. Garnish with parsley and fried bacon and serve.

Macaroni Cheese

4oz. of macaroni
6oz. of grated cheese
2oz. of butter
1oz. of flour
1 pint of milk
Salt, cayenne pepper, and a little made mustard

Cook the macaroni in boiling, salted water till tender, about 20 minutes. Strain off the water and put macaroni on a plate. Melt the butter in the saucepan in which the macaroni was cooked, remove from fire, and add flour and seasoning. Stir well till smooth. Add half of the milk gradually, return saucepan to range, and cook the sauce. Add remainder of milk gradually as sauce thickens. Add cooked macaroni and half of cheese. Pour into pie-dish and sprinkle rest of cheese on top. Brown in oven or under griller when required.

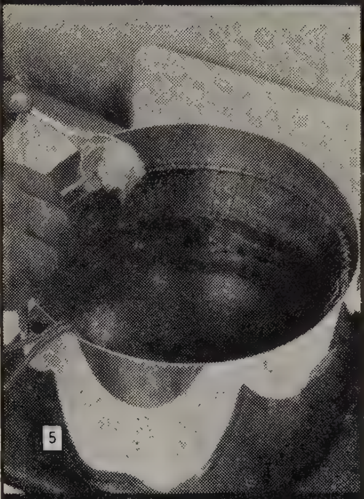
Baked Beans

1lb. of haricot beans
4oz. of bacon
1 level teaspoon of made mustard
½ pint of tomato puree
1 level teaspoon of salt
Boiling water
2 tablespoons of golden syrup

Wash beans, pour boiling water over them, and allow to stand for 24 hours. Cook till tender. Pour off water, add golden syrup, salt, mustard, and bacon cut in pieces. Add sufficient boiling water barely to cover the beans and bake 3 hours in oven. Add tomato puree, reheat, and serve on toast.

4

Add stiffly beaten whites and mix thoroughly.



5

Fry in teaspoonfuls in deep fat.

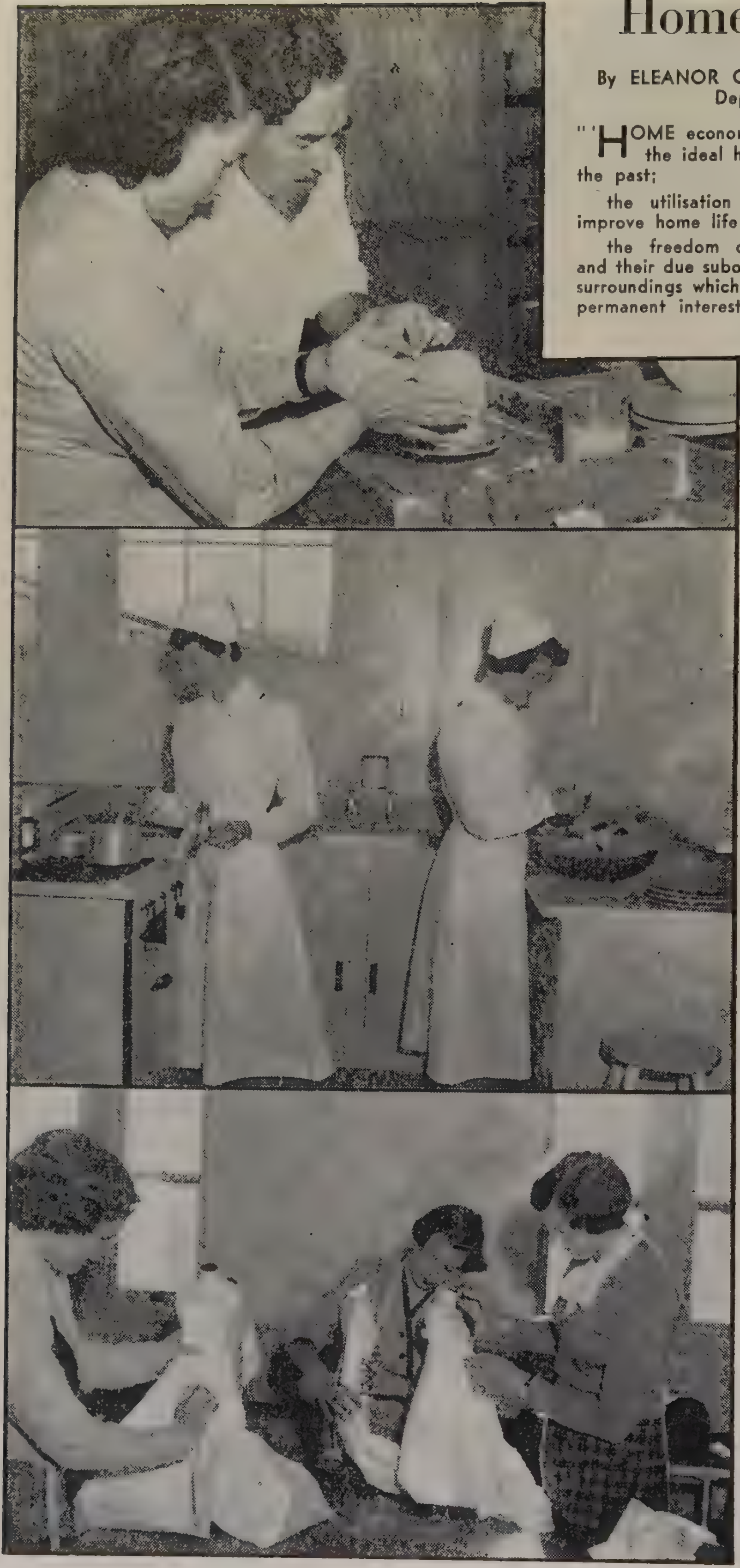
6

Drain on kitchen paper.

Home Science School

By ELEANOR COUSTON, Field Officer in Rural Sociology, Department of Agriculture, Timaru

> "'HOME economics' stands for
> the ideal home life of today, unhampered by traditions of the past;
>
> the utilisation of all the resources of modern science to improve home life;
>
> the freedom of the home from the dominance of things, and their due subordination to ideals; for the simplicity in material surroundings which will free the spirit for the more important and permanent interests of the home and of society."
>
> —*Ellen Richards*



THESE high ideals expressed by the "mother" of home economics are the basis upon which home science training is founded.

In January 1911 after the enthusiastic efforts of Lieutenant-Colonel John Studholme, C.B.E., D.S.O., to establish a university course in home science in New Zealand, the first dean of the Home Science School, Professor W. L. Boys-Smith, arrived from England to take up the post. To convince the University Council that such a course was extremely desirable, Colonel Studholme had written:—

> Finally, all are agreed that the condition of the average home in a country is a true index of the condition of that country. The character of the home depends essentially on the woman; it is her sphere of action. Surely, therefore, the knowledge that will enable the woman successfully to manage her own home is second to none in importance, and should be given the status of a degree course by universities, and should be honoured and stimulated in every possible way.

Course Begun

The assets with which Professor Boys-Smith started the course were meagre and consisted of a tin shed which the School of Mines had recently vacated and a limited sum of money for initial expenses. She worked assiduously, drawing up courses of study and making the premises habitable, and when Miss G. H. Rawson, her assistant, arrived in June some classes had already started. From these small beginnings the course steadily developed, and when classes overflowed and the tin shed deteriorated further the Government made provision for a permanent building, which was opened in 1920. Studholme House had also been opened as a practice hostel and was extended to provide residence for students.

On the retirement of Professor Boys-Smith, Miss Rawson, who was then lecturer in chemistry and economics, was appointed Dean of the Department of Home Science and Warden of Studholme House. At this time the University Council approached Mrs. Ann Gilchrist Strong,

Upper—Pottery making in the design and crafts department. Middle—Food preparation in a unit kitchen in the senior foods laboratory. Lower—Advanced students designing frocks on miniature dress forms.

a highly qualified American home economist, who was engaged at the time in introducing home science into the native state of Baroda, India, and offered her the post of Professor of Household Arts.

Progress

So through the years the school developed, with English tradition combining with progressive ideas from America. Degree and diploma courses were established, and now well-equipped laboratories testify to the progress made. The pioneers of the course, with vision and tenacity, overcame all obstacles and established a course which was unique in Australasia.

High standards were established, which have given the course world status. This status is carefully preserved, and the present Dean, Dr. Elizabeth Gregory, Ph.D., has recently returned from an extensive tour of England, Scotland, Scandinavia, and the United States, where she investigated standards of training in home science subjects. The aim of the school is to maintain standards of scholastic and practical value equal to those in other parts of the world.

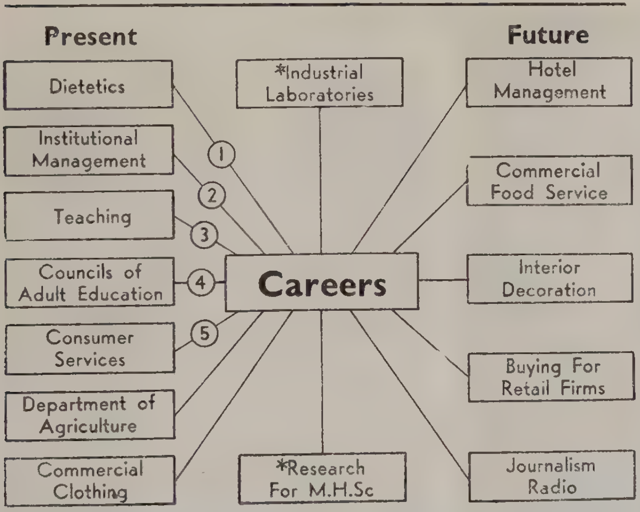
Teaching practice. A student conducting a cookery lesson at a manual training centre.

Although the primary objective is to graduate students with a sound scientific knowledge in home making, it is now generally realised that every woman should be equipped with a career. Then, should circumstances arise where she must support herself or her dependants, she is well able to do so. The attraction of high wages on leaving school often leads young women into dead-end jobs, whereas a university education will lead to satisfying and lucrative positions and the prospect of advancement. Apart from specialised educational facilities, a university life also provides opportunities for the development of an appreciation of drama, music, art, and literature, for activity in the field of sport, and for social contacts which are valued for life. The wide range of careers now open for graduates from the Home Science School and the possibilities for the future can be seen on the accompanying chart.

From the narrow field where teaching was the one possibility, new vistas have opened and opportunities abound both in New Zealand and overseas. Graduates from the Home Science School can be found in many parts of the world, including England, America, South Africa, and the Pacific Islands, doing varied and interesting work for which their training has provided the necessary background.

There is an insatiable demand for qualified teachers, dietitians, institutional managers, extension workers, and rural sociologists, and these spheres, together with matrimony, rapidly absorb the graduates.

Home Making



1—Hospitals, Health Department. 2—Hostels, schools, health camps. 3—Universities*, training colleges*, secondary intermediate schools, manual training centres. 4—Lectures and demonstrations to town and country women. 5—Demonstrating for gas and electricity suppliers, Standards Institute.
*** B.H.Sc. qualification necessary.**

Photographs on opposite page and photograph above by E. A. Phillips.

A laundry class in the early days.

[*E. A. Phillips photo.*

Analysing foods in a food chemistry class.

Careers in Home Science

Of particular interest to the rural housewife is the development of home science extension in the Department of Agriculture. In 1945 an advisory service in home science for country women was formed with the appointment of Rural Sociologists, now Field Officers in Rural Sociology, most of whom are graduates of the home science school.

An important work of these specialists is the preparation of articles for "The New Zealand Journal of Agriculture". Another section of their work is lecturing or demonstrating in subjects pertaining to the home, particularly at farm schools, but also on request to women's organisations. Summer and winter shows where the Department of Agriculture has a stand are also attended by the Field Officers in Rural Sociology, and their exhibit each year is planned around some topic of practical interest.

Specific inquiries, by interview or letter, are handled by Field Officers in Rural Sociology, who are frequently asked to help with suggestions for kitchen alterations, interior decoration, or to advise on cookery or housewifery problems. Research on rural home makers' problems, though yet on a small scale, is an important activity.

Fabric printing. [*E. A. Phillips photo.*

For young women interested in rural development rural sociology is a highly absorbing career, and, although comparatively new in New Zealand, holds tremendous possibilities. A knowledge of rural conditions and a home science training combines adequately to make for competence in this profession.

Prerequisites for Home Science

Owing to specialisation in the school curriculum, it is important for parents and children to plan ahead and to formulate ideas concerning the choice of a career. The services of careers mistresses and vocational guidance officers, who will supply much helpful information, are available.

The Home Science School offers two courses, the diploma course, which is a 3-year course and more suited to those interested in home arts, and the degree course of 4 years, for those interested more in science. Where secondary educational attainments have been sufficiently high the degree course is recommended, because a degree from the University of New Zealand receives recognition in any part of the world, whereas a diploma has certain limitations. For students who wish to continue their studies for a master's degree or doctorate or to do research a degree is essential.

The prerequisites for the two courses are University Entrance (degree course) or Endorsed School Certificate (diploma).

Prospective students for the degree course should include chemistry, mathematics, and some physics in their school curriculum, as a background of these subjects is important for scientific studies at university level. For the diploma course a knowledge of chemistry and mathematics is desirable.

The home science course includes such subjects as: chemistry, physics (degree only), zoology, physiology and biochemistry, clothing and textiles, design and crafts, food and nutrition, household economics, and institutional management.

Bursaries

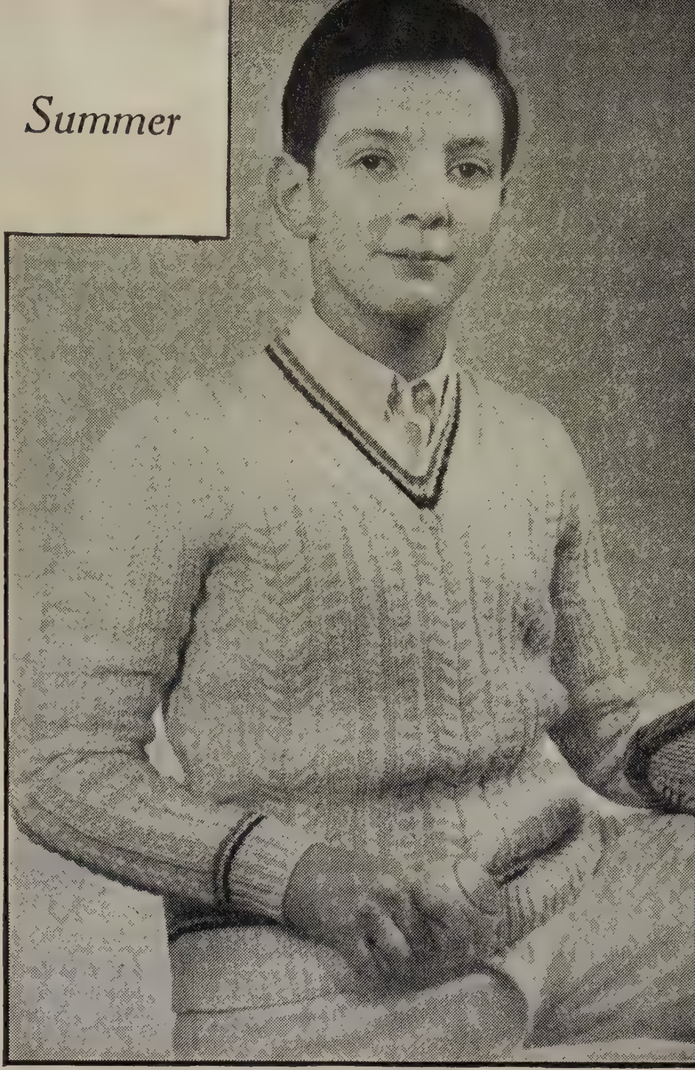
Bursaries are available for many students both for tuition fees and for boarding allowance and these provide substantial financial assistance throughout the course. All particulars concerning the home science curriculum and bursaries may be obtained from the Dean, School of Home Science, University of Otago.

Finally, on qualifying, graduates may become members of the Home Science Alumnae. This is virtually the Old Girls' Association of the Home Science School, and all who belong deem it a privilege. It links its members throughout the world and through its journal provides them with recent advances in all fields of home science.

To be a graduate of the Home Science School of the University of Otago means more than just scholastic attainment; it means a scientific knowledge in all household arts which will enable a young woman to adapt herself efficiently to home making, to the care of her family, or to a variety of interesting careers.

Long-sleeved Sports Pullover for Summer

A LONG-SLEEVED woollen pullover is considered almost indispensable for summer sports. White is the popular colour and the pattern given provides for small bands of contrasting colours.



MATERIALS required are 15oz. of white, 1oz. of blue, and 1oz. of red double knitting wool and 2 No. 10 and 2 No. 8 needles.

Measurements: Length, 21in.; chest, 34in.; sleeve, 18in.

Tension: 1 complete patt. measures 4½in.

Abbreviations: K., knit; p., purl; st., stitch(es); tog., together; rep., repeat; patt., pattern; cont., continue; beg., beginning; inc., increase; dec., decrease; sl., slip.

Back

With No. 10 needles and white wool, cast on 98 st. and work 2½in. in k. 1, p. 1 rib. Change to blue wool and k. 1 row. Next row: Rib to end. Change to white wool and k. 1 row. Next row: Rib to end. Change to red wool and k. 1 row. Next row: Rib to end. Change to white wool and k. 1 row. Next row: Work twice in first st., * rib 17 (work twice in next st.) twice, rib 3, (work twice in next st.) twice, rib 3. Rep. from * to last 16 st., rib 16 (111 st.).

Change to No. 8 needles and work in patt. thus:—

1st row: P. 2, * k. 4, p. 2, sl. 1, k. 1, pass sl. st. back on to left-hand needle and k. into the back of it (this will be referred to as twist 2), p. 2, k. 4, p. 2, k. 6, p. 1, k. 6, p. 2. Rep. from * to last 16 st., k. 4, p. 2, twist 2, p. 2, k. 4, p. 2.

2nd row: K. 2, * p. 4, k. 2, p. 2, k. 2; p. 4, k. 2, p. 6, k. 1, p. 6, k. 2. Rep. from * to last 16 st., p. 4, k. 2, p. 2, k. 2, p. 4, k. 2.

3rd row: P. 2, * k. 1, p. 2, k. 1, p. 2, twist 2, p. 2, k. 1, p. 2, k. 1, p. 2, sl. next 3 st. on spare needle and leave at back of work, k. 3, k. 3 from spare needle, p. 1, sl. next 3 st. on spare needle and leave at front of work, k. 3, k. 3 from spare needle, p. 2. Rep. from * to last 16 st., k. 1, p. 2, k. 1, p. 2, twist 2, p. 2, k. 1, p. 2, k. 1, p. 2.

4th row: K. 2, * p. 1, k. 2, p. 1, k. 2, p. 2, k. 2, p. 1, k. 2, p. 1, k. 2, p. 6, k. 1, p. 6, k. 2. Rep. from * to last 16 st., p. 1, k. 2, p. 1, k. 2, p. 2, k. 2, p. 1, k. 2, p. 1, k. 2. These 4 rows form the patt. Cont. in patt. until work measures 13in.

Shaping the armholes: Cast off 4 st. at beg. of next 2 rows, then dec. 1 st. at both ends of every row until 91 st. remain. Cont. straight until work measures 21in.

Shaping the shoulder: Cast off 9 st. at beg. of next 2 rows, then 10 st. at beg. of next 4 rows. Cast off remaining 33 st.

Front

Work as given for back until armhole shaping is completed (91 st.).

Shaping the neck: Next row: Patt. 45, work twice in next st., patt. to end. Next row: Patt. 46, turn and work in patt. on this set of 46 st. for one side of neck thus:—

1st row: Patt. 9, work 2 tog., patt. to end. 2nd and 3rd rows: Patt. to end. 4th row: Patt. to last 11 st., work 2 tog., patt. 9. 5th and 6th rows: Patt. to end.

Rep. these 6 rows 7 times more, than 1st row once again (29 st.). Cont. in patt. on these st. until work measures 21in., ending at armhole edge.

Shaping the shoulder: Next row: Cast off 9, patt. to end. Next row: Patt. to end. Next row: Cast off 10, patt. to end. Next row: Patt. to end.

Cast off. Rejoin wool to remaining 46 st. at centre and work to match first side.

Sleeves

With No. 10 needles and white wool cast on 36 st. and work 2in. in k. 1, p. 1 rib. Now work the colour bands in as given for back, ending with 1 row in white after red stripe.

Next row: Work twice in first st., rib 13 (work twice in next st.) twice, rib 3, (work twice in next st.) twice, rib to end (41 st.).

Change to No. 8 needles and work in patt. thus: 1st row: K. 2, p. 2, twist 2, p. 2, k. 4, p. 2, k. 6, p. 1, k. 6, p. 2, k. 4, p. 2, twist 2, p. 2, k. 2. 2nd row: (P. 2, k. 2) twice, p. 4, k. 2, p. 6, k. 1, p. 6, k. 2, p. 4, (k. 2, p. 2) twice. 3rd row: P. 1, k. 1, p. 2, twist 2, p. 2, (k. 1, p. 2) twice, sl. next 3 st. on spare needle and leave at back of work, k. 3, k. 3 from spare needle, p. 1, sl. next 3 st. on spare needle and leave at front of work, k. 3, k. 3 from spare needle, p. 2, (k. 1, p. 2) twice, twist 2, p. 2, k. 1, p. 1. 4th row: K. 1, p. 1, k. 2, p. 2, k. 2, p. 1, k. 2, p. 1, k. 2, p. 6, k. 1, p. 6, k. 2, p. 1, k. 2, p. 1, k. 2, p. 2, k. 2, p. 1, k. 1.

These 4 rows form the patt. Cont. in patt., inc. 1 st. both ends of following 9th and every following 8th row until there are 65 st. on needle, working extra st. in block patt. and twists. Cont. straight until work measures 18in.

Shaping the top: Dec. 1 st. at both ends of alternate rows until 35 st. remain, then cast off 3 st. at beg. of next 6 rows. Cast off rem. st.

Neck Band

Back: With right side of work facing, using No. 10 needles and white wool, pick up and k. 28 st. across back of neck. Next row: Rib to end. Now work the stripe band as given for back, ending with 1 row in white after last red stripe. Cast off in rib.

Front

With right side of work facing, using No. 10 needles and white wool, pick up and k. 44 st. down shaped neck edge, pick up 1 st. at centre, then pick up and k. 44 st. up second side of neck (89 st.). Now work as given for back, dec. 1 st. at both sides of centre st. on every row.

Making up

Press the work lightly on the wrong side, using a warm iron and a damp cloth. Join side, shoulder, and sleeve seams. Sew in sleeves.

Rayon Fabrics

THOUGH the natural fibres, cotton, linen, wool, and silk have been known for centuries, the fifth basic fibre, rayon, has been known for little more than 50 years. It is the culminating product of an idea of a British scientist, Dr. Robert Hooke, who as long ago as 1664 first suggested the possibility of making an "artificial glutinous composition much resembling, if not full as good—nay, better, than that excrement or whatever other substance it be out of which the silkworm wire-draws his clew". Science has progressed far since then, and new man-made fibres are being produced and tested almost daily. The story of rayon is the subject of this article by Maud B. Strain, Field Officer in Rural Sociology, Department of Agriculture, Dunedin.

THE definition of rayon as approved by the council of the Textile Institute of Great Britain in March 1950 is "regenerated fibre wholly or mainly of cellulosic origin". It does not include nylon and other true synthetic fibres which do not have their origin in cellulose. The story of man-made fibres is most interesting. Early in the 18th century a French scientist studying insects and the fibres they make in spinning webs or cocoons came to the conclusion that man too could make a fibre out of gum or resin.

In the next 100 years scientists discovered that a substance called cellulose, found in all trees and plants, might be used to make a fibre. A Swiss chemist in 1855 finally found a way to change the cellulose of plants into a gummy, half-liquid solution. However, instead of forcing the liquid through fine holes as insects do, he tried to form filaments by dipping needles into the solution and drawing the solution out into a thread. This method was not practical. An English physicist, Sir John Swan, trying to find an inexpensive filament for the recently invented electric light, added the next link in 1880. He succeeded in making a long, unbroken thread by forcing the cellulose solution through a fine hole, and thus invented the first practical method of spinning out a fibre, the very first spinneret.

The first man-made fibre of any commercial value as a textile was produced by Count Hilaire de Chardonnet, who in 1884 made a fibre by using pulp obtained from a mulberry tree. His product appealed to financiers of his day, and with their support he built the world's first fibre factory. His method was called the nitrocellulose process and made use of the cellulose of mulberry leaves. Later he found that cotton linters, the short, hairy fibres that cling to the cotton seeds after the longer fibres are removed, served equally well, and at present this material is one of the main sources of supply of cellulose for the rayon industry.

Manufacturing Processes

Three manufacturing methods in use at present are the cuprammonium, viscose, and acetate processes, each producing a particular type of fabric. The first is expensive and consequently not used to any great extent, though the fabrics produced by this method are fine and soft, closely resembling silk. The various processes differ in the method by which the raw materials, cotton linters or wood pulp, are dissolved, but they are all similar in that the solution is forced through fine holes into warm air or some other medium which solidifies into filaments the fine streams of liquid coming through. These filaments are lightly twisted together to form yarn.

In the cuprammonium and viscose processes the original raw cellulose is changed chemically into another form and then changed back, that is, regenerated, into purified cellulose. The acetate process gives a different end product, cellulose acetate, which, though derived from cellulose, does not behave in the same way as cellulose. It can be completely melted by an iron that is too hot. About 80 per cent. of the world's annual production of rayon is made by the viscose process and is usually referred to as "rayon"; that made by the acetate method is sometimes referred to as "acetate rayon" or simply "acetate".

Spun Rayon

Spun rayon is not another type of rayon fibre; it can be either viscose or acetate. During manufacture rayon appears as long, thread-like filaments. These may be cut into short, uniform lengths of from ½in. to 9in. These short lengths are spun into yarns in the same way as cotton and wool are spun and the resulting yarns are different from the ordinary rayon yarns. According to the way it is spun this short rayon can be made stronger, less lustrous, and adaptable to napping and other finishes. In this way fabrics can be produced resembling in appearance wool, linen, or cotton. Also it may be combined with any of the natural fibres. Spun rayons are generally spongier and more absorbent than filament rayons.

Rayon as a Textile

For economy cotton must be given first place among the natural fibres. Wool and cotton are also very versatile fibres. Linen is stronger, more absorbent, more resistant to soiling, and possesses a greater natural crispness; however, in warmth and crease resistance wool and silk are supreme. Rayon is economical, extremely versatile, combines many of the properties of the individual natural fibres, and can be woven to simulate any of them. Rayon provides fabrics of pleasing and often luxurious appearance comparable with that of costly silks and linens, yet at a moderate price. It helps to supply the world's textile needs, which could not be met by natural fibres alone, and woven in combination with silk and wool it helps to make the natural fibres go further. It does not deteriorate with age, and white rayon does not need blueing or bleaching to keep it white.

Its great value is its economy; it can be produced and marketed more cheaply than the natural products, but

IRONING CHART FOR RAYONS

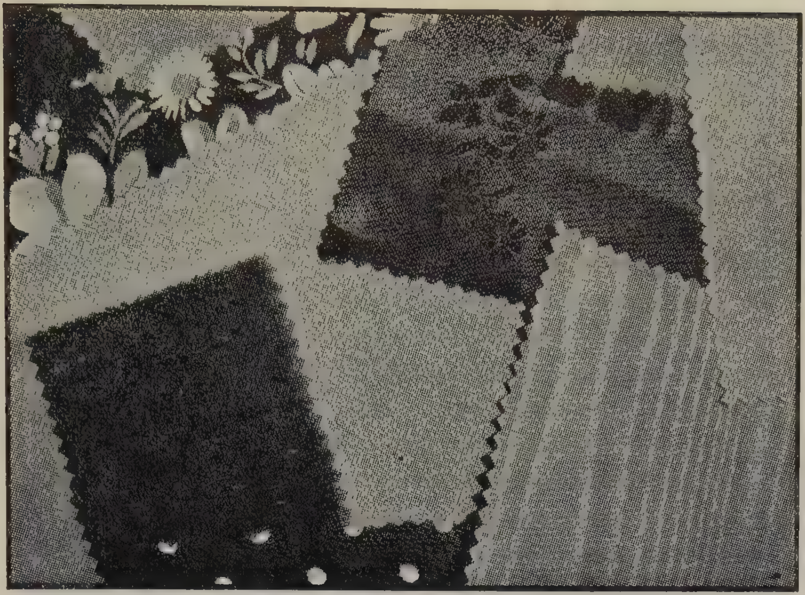
Fabric	Dampness	Iron heat
Washable crepes ..	.. Almost dry ..	Moderately hot
Heavy spun	.. Slightly damp ..	Hot
Dress-weight spun ..	.. Dry	Hot
Sheer spun	.. Almost dry ..	Hot
Sharkskin	.. Noticeably damp	Warm
Jersey	.. Slightly damp ..	Warm
Washable satins—		
Heavy, dress-weight	Noticeably damp	Warm to moderately hot
Lightweight, lingerie	Almost dry ..	Moderately hot

for hard wear the natural fibres appear to retain their supremacy. There are a few uses for which rayon is not suitable, such as for sheets and pillow cases, and nothing can equal linen for tea towels and table cloths receiving hard wear. Garments such as shirts and blouses and children's wear, where the main consideration is serviceability, are best made from natural fibres.

Behaviour in Wear

Rayon has not the natural resilience of silk and creases easily. Resistance to creasing can be improved in various ways; for instance, the tightly twisted yarns of crepe-surfaced materials and the fine threads of gossamer-sheer materials offer some degree of crease resistance. Also the patented crease-resistant finishing processes are quite satisfactory, but the directions for washing fabrics treated for crease resistance must be followed. These directions say "wash as wool". Spun rayon is softer and more flexible than filament rayon and is more inclined to shed creases. Rayon drapes well, particularly the acetate and cuprammonium types.

Water repellency presented something of a problem in acetate rayon, which has some of the ideal qualities required in a fibre for making water-repellent fabrics. The fibres do not swell readily in water and their smooth contour and fineness enable them to be woven into compact fabrics of smooth surface texture, but these very qualities provided the main difficulty in successfully applying proofing agents. In the past shower-proof processing methods had depended on wax or mixtures of wax and metallic salt which, though excellent with natural fibres, were not as good with synthetics. The smooth contours of the man-made fibre gave little anchorage to wax and other films. This difficulty was overcome by the recently developed silicones, which give a highly water-repellent, flexible film with powerful adhesion. Silicones form the basis of the new waterproof glazes for motor-cars.



Varieties of filament rayons.

Comparison between Types

Regenerated and acetate rayons, being different in chemical composition, are different in their reactions. This fact is so important that recently issued American Federal Trade Commission rules stipulate that fabrics must carry a label saying exactly which type of fibre is in the fabric, one being called "rayon" and the other "acetate".

Rayon (Regenerated)

The fibre known as rayon, the regenerated fibre, has the following characteristics. It is more like cotton, is absorbent and slow drying, and may shrink on washing for the first time.

It takes the same dyes as cotton; therefore the colours can be made highly resistant to fading.

It can be made crease and spot resistant.

It can be laundered and ironed at fairly high temperatures; boiling is not recommended, but hot water can be used. Rayon tablecloths should not be boiled.

It can be used for making almost any type of fabric.

It burns like cotton.

Acetate

Characteristics of the acetate fibre are as follows:—

It is not like any other fibre; it is not very absorbent and dries quickly.

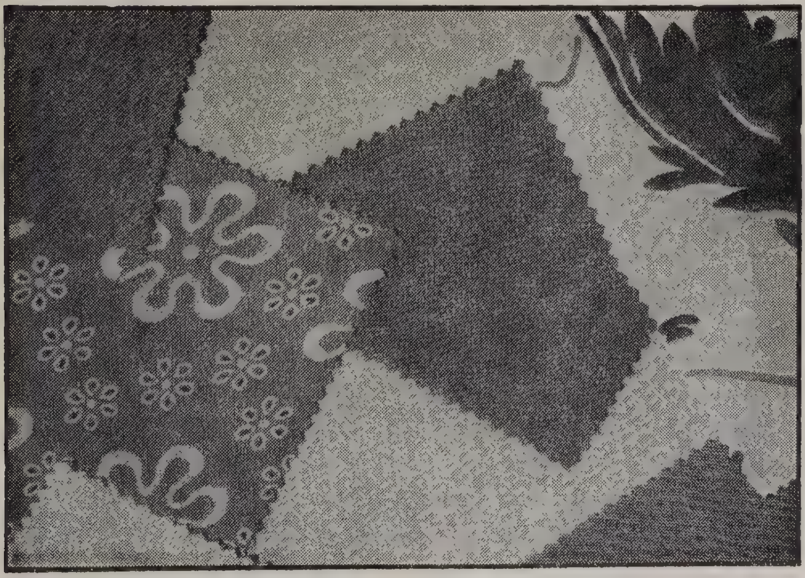
It resists soiling, and requires mild washing temperatures.

It is crease resistant, but hard wringing during laundering may introduce creases difficult to iron out.

It is sensitive to heat and must never be ironed with a hot iron. It should be ironed on the wrong side while only very slightly damp.

It is unaffected by dyes other than those specially developed for it.

It is readily damaged by acetone, which is an ingredient of most nail polishes, lacquers, and removers. It is also affected by some of the ordinary fat solvents used for removing grease spots from fabrics. Chloroform will dissolve acetate; even spots of scent have been known to cause holes.



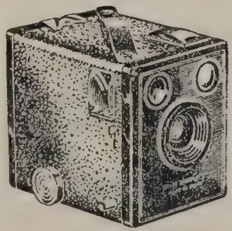
Varieties of spun rayons.

Identification Tests

Ready-made garments and material by the yard of these fabrics often carry a label identifying the material and giving instructions for cleaning. If it is not possible to identify the material at the time of purchase, a simple test may be carried out at home. Lengthwise and crosswise fibres should be frayed out from a small piece of material and should be tested

KODAK
Gifts for everyone

KODAK Cameras and BROWNIE Cameras



There are Kodak Cameras and Brownie Cameras to please everyone. Priced from 22/11 for the Baby Brownie model to £81/14/9 for the Kodak Retina IIA model with f.2 lens.

(Above right) 620 Brownie model C £2/4/8. Other models,, £2/12/10 and £3/3/-.

(Right) 620 Kodak Duaflex Camera. View finder shows pictures actual size. £5/16/3.

Kodak
KODAK SUPER-XX
Kodak
KODAK VERICHROME

KODAK FILM

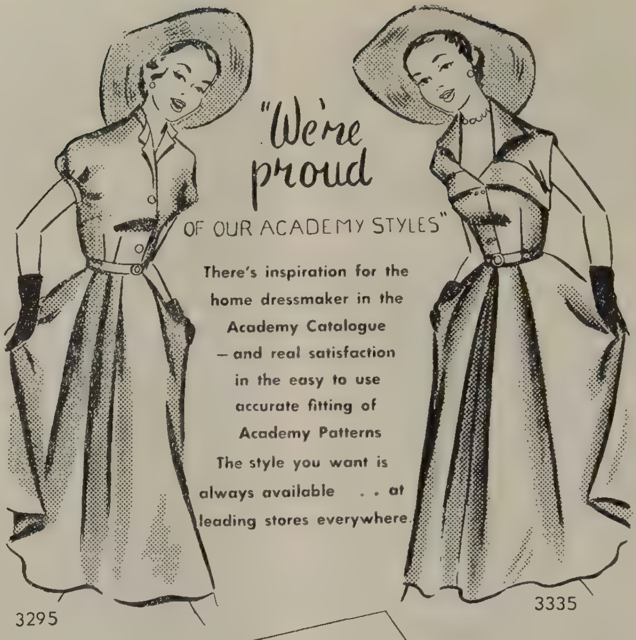
Always an acceptable gift. All popular sizes — Kodak Verichrome Film; Kodak Panatomic-X Film; Kodak Super-XX Film.

DOZENS OF OTHER PHOTOGRAPHIC GIFTS

Cine Cameras and Projectors; Cine Accessories; Exposure Meters; Camera Cases; Albums; Accessories for indoor photography; and many more. Write for free illustrated folder packed with gift ideas.

KODAK NEW ZEALAND LTD.

292 Lambton Quay, Wellington. 162 Queen St., Auckland. 681 Colombo Street, Christchurch. 162 Princes Street, Dunedin.

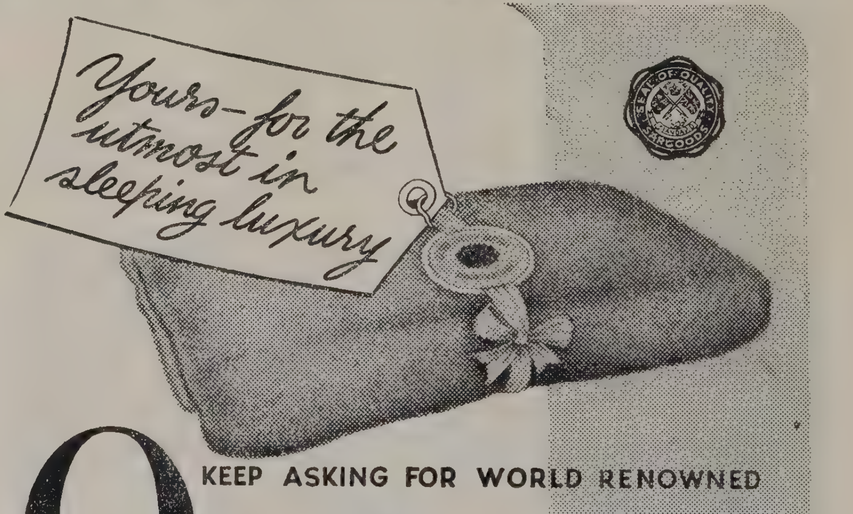

"We're proud
OF OUR ACADEMY STYLES"
3295
3335

There's inspiration for the home dressmaker in the Academy Catalogue — and real satisfaction in the easy to use accurate fitting of Academy Patterns The style you want is always available . . at leading stores everywhere.

Academy PATTERNS

A22

they're fashioned to fit


Yours—for the utmost in sleeping luxury

KEEP ASKING FOR WORLD RENOWNED

Onehunga
BLANKETS

DISTRIBUTED THROUGHOUT N.Z.
BY SARGOOD SON & EWEN LTD

in the flame of a candle. Regenerated (viscose) rayon burns like cotton, giving a slight, feathery ash. Acetate blazes readily and forms a brittle black ash difficult to crush between the fingers.

Lustre

Rayon is a naturally lustrous fibre. Admired at first, this lustre became unpopular because, not being the soft rich lustre of silk, its metallic sheen was thought to denote artificiality and cheapness. Today rayon is delustred where necessary during manufacture. With acetate this is sometimes accomplished by boiling in soap solution. So treated, rayon may show patchiness when washed and ironed unless it is carefully handled. This patchiness is due to a partial restoration of the lustre of the fibres and is mainly caused by ironing the material while it is unevenly damp. When being ironed the fabric should be almost dry. If of only medium dampness, delustred fabrics may become evenly lustrous.

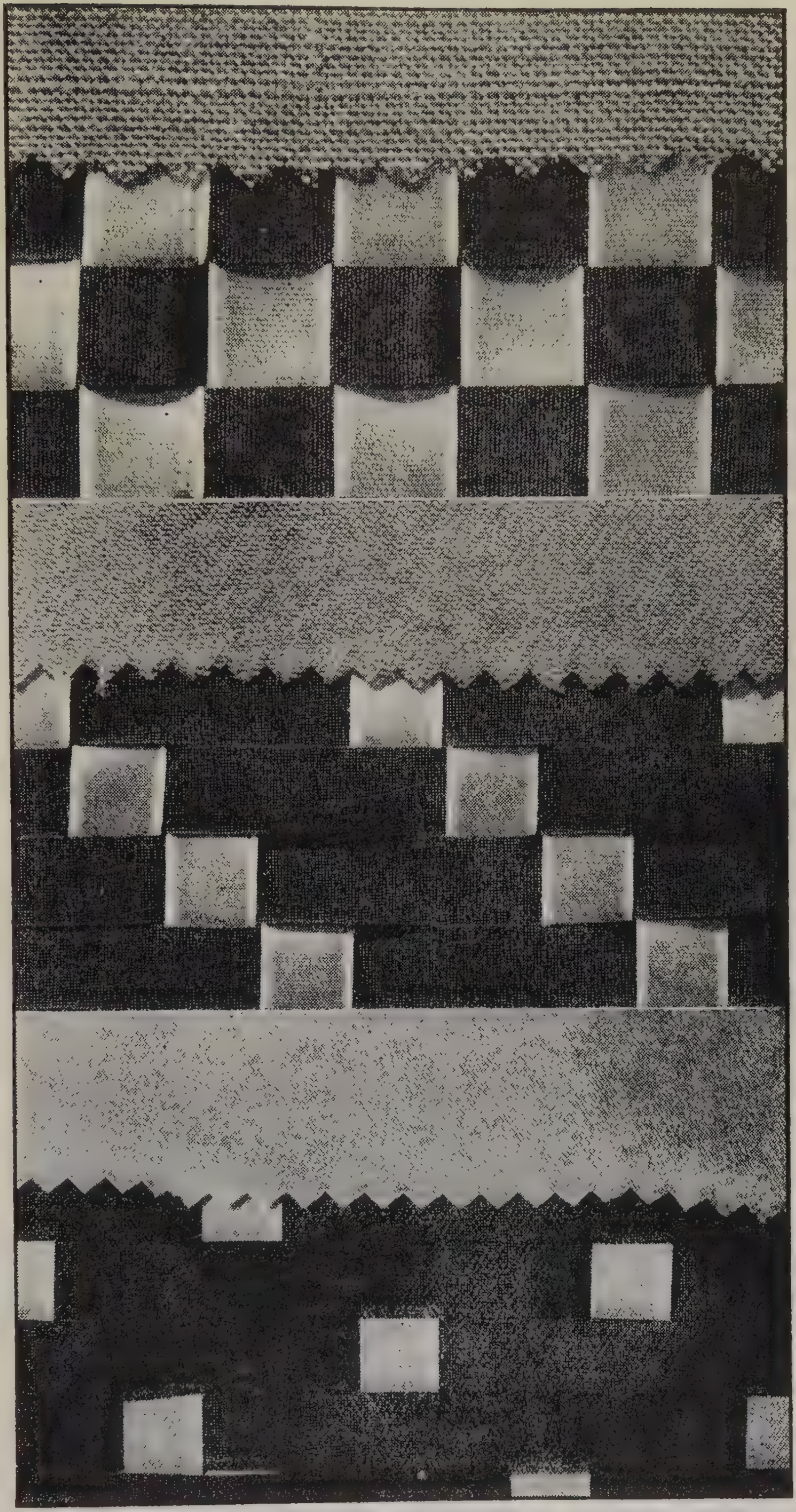
Laundering

In general smooth, flat fabrics are likely to wash well, but fabrics in the crepe family may give trouble. The smoother and flatter the crepe the better will it wash; the more creped the fabric is the more likely it is to shrink or stretch. Mossy and pebble crepe should be sent to be dry cleaned. Soft water and mild soap are all that are needed to clean rayons. Warm water comfortable to the hands should be used. Putting the material through a second lot of suds is preferable to hard rubbing, and thorough rinsing is essential. Most rayons lose strength when wet and should be gently squeezed between the hands rather than rubbed. Garments should be lifted gently from the water and folded in a towel before being put through the wringer.

If an electric wringer is being used, the tension should be slackened off and care should be taken that there are no pockets of water imprisoned in a fold of the fabric; pressure of water unable to escape quickly has been known to split rayon. Also rayon has a tendency to cling to rubber and become wound round the rollers; hence the suggestion that it be folded in a towel. Rayons do not need bleaching or blueing. Bleaches tend to weaken any fabric and may be harmful to the finish. Usually they do not need starching, many of the present fabrics having a crisp, crease-resistant finish.

Drying

Rayons may be dried by rolling them in a turkish towel; however, they will come to no harm if hung carefully on a line. They should be hung on the straight of the material and secured with clip pegs on the part of the garment where there is most support, as, for example, the seam. Also the fabric should be eased in between the pegs and not stretched out. Garments should never be hung by the bottom hems. They should not be in strong sunlight and they should not be left to freeze on the line. Should the day be windy, rayons are better dried over a line inside; too much blowing twists and pulls them out of shape, and friction where they have been pegged may cause holes.



Varieties of rayon weaves. In each illustration an artificial representation of the enlarged detail of the weave has been placed below the material. Upper—Plain weave. Middle—Twill weave. Lower—Satin weave. The enlarged detail of this weave shows how the distance between cross threads causes the material to snag readily.

548—RAYON FABRICS . . .

Ironing

Rayons should be ironed while still damp, never sprinkled. They should be ironed with the grain rather than across it and in single thickness. It is advisable to avoid ironing over seams, creases, elastic, fasteners, and buttons, as this causes pressure on the material and may result in the formation of marks, unsightly glaze, or holes. Slide fasteners should be closed, and a thick towel placed underneath and a pressing cloth on top to avoid making a shiny ridge. Gathers are best managed by ironing into them, never across them; by using a cool iron they can be done slowly without danger of scorching. Owing to the fact that acetate rayon can be melted or glazed by an iron not hot enough to scorch other vegetable fibres, it is most important to use a cool iron; even the viscose type, although it does not melt, may be glazed. Glaze marks made by a too-hot iron cannot be removed.

Variety of Weaves

There is a considerable variety of rayon fabrics available to the consumer; hence it is necessary to choose carefully according to the use to which the fabric is to be put. Certain types give greater service and others have a more luxurious appearance. This brings up the matter of weave. All woven fabrics belong to one or other of three basic weaves or variations of these basic weaves, which are plain, twill, and satin weaves.

In **plain weave** each up and down thread goes over one cross thread and under the next as in ordinary darning. This is simple and durable.

Twill weave can be identified by diagonal ribs in the fabric and is known for its good wearing qualities.

Satin weave can be recognised by its smooth, glossy surface and its attractive appearance.

When a fabric is being selected for a garment that is to have hard wear durability is the first consideration; hence it would be advisable to choose a twill weave, although many plain weaves are known to possess good wearing qualities. For occasions where appearance is of paramount importance the satin weave and its variations such as velvets are a frequent choice.

If the maker's tag with instructions is attached to the material or garment, it is important to follow implicitly the directions given, these being issued by those who know exactly what fibres are contained in the material, what dyes and finishes have been used, and what treatment is necessary to give the greatest satisfaction.

Whether the aim Robert Hooke visualised has been accomplished or not is a debatable point and is not relevant here; the important fact is that man has succeeded in making fibres to his own design and is able to control and alter them to suit his purpose. Whether rayon will maintain its present position in the textile world or whether it will be superseded by the true synthetics, of which nylon is perhaps the best known, is something which must be left to the future.

All illustrations by Campbell Photography.

Salad Dressings

By NELL MACPHERSON, Field Officer in Rural Sociology, Department of Agriculture, Auckland

THERE are four main types of salad dressings and by using variations of these one can add considerable interest to salads.

THE main types are: Cooked salad dressing, mayonnaise dressing, French dressing, and cream dressing. Recipes for these are given here.

[*Sparrow Industrial Pictures Ltd. photo.*

Cooked Salad Dressing

Cooked salad dressing is a combination of eggs, liquid, flour, vinegar, and seasoning. The basic recipe for this dressing and its variations is as follows:—

2 tablespoons of flour
1 teaspoon of mustard
2 tablespoons of butter
2 tablespoons of sugar
Cayenne pepper to taste
1 beaten egg
1 cup of milk
¼ cup of vinegar
1 teaspoon of salt

Mix the dry ingredients thoroughly and add them to the beaten egg, mixing well. Carefully stir in the milk to avoid lumps and then gradually add the vinegar, stirring constantly. Heat gently, stirring constantly, until the mixture thickens. Add the butter and blend it in well. This recipe makes 1¼ cups of dressing, which may be kept in a cool place for some days.

When the dressing is to be used add an equal quantity of cream or top milk and stir well in.

Variations

Cheese: Add ½ cup of grated cheese to 1 cup of the basic dressing and melt it in.

Bacon: Chop one rasher of bacon into small pieces and fry it gently until it is brown. Drain off the fat and add the cooked bacon to ½ cup of basic salad dressing.

Celery: Add 1 tablespoon of finely chopped celery leaves to 1 cup of basic salad dressing.

Mayonnaise Dressing

2 egg yolks lightly beaten
1 teaspoon of salt
A good shake of pepper
2 cups of salad oil
2 tablespoons of lemon juice
2 tablespoons of vinegar
1 teaspoon of sugar (if desired)

Add the dry ingredients to the egg yolk, stirring well. Add the lemon juice and vinegar gradually, stirring well all the time. When all the lemon juice and vinegar is in, beat the mixture well with a spoon. Add the oil very slowly, beating the mixture all the time. When half the oil is in, the remainder may be added more quickly, but the beating must be done carefully to avoid curdling the mayonnaise. This recipe makes 1 pint of dressing, which may be kept in a cool place for some days. It should not be stored near the freezing compartment of a refrigerator.

Variations

Cucumber: Add ½ cup of fresh cucumber pulp to 1 cup of mayonnaise and blend it well.

Chives: Add 2 tablespoons of chopped chives and 1 dessertspoon of Worcester sauce to 1 cup of mayonnaise.

Horse-radish: Add ¼ cup of freshly grated horse-radish to 1 cup of mayonnaise and blend well.

Green: Add ½ cup of finely chopped watercress or parsley to 1 cup of mayonnaise.

French Dressing

4 tablespoons of olive oil
1 tablespoon of lemon juice or vinegar
A good shake of pepper
½ teaspoon of salt

First method: Put the oil and dry ingredients in a basin and beat well. Add the lemon juice drop by drop, beating the mixture thoroughly all the time.

Second method: Put all the ingredients into a wide-mouthed bottle. Cork the bottle and shake it thoroughly to blend the ingredients just before using the dressing. This makes a bare ½ cup of dressing.

Variations

Mustard: Add 1 teaspoon of mustard to the dry ingredients before mixing.

Curry: Add a good pinch of curry powder to the ingredients before mixing.

Mint: Lightly stir 1 tablespoon of finely chopped mint into the dressing just before using.

Cream Dressing

4 tablespoons of sweet cream
2 tablespoons of lemon juice
1 teaspoon of sugar
Pinch of salt
Shake of pepper

Add the sugar, salt, and pepper to the cream and then gradually beat in the lemon juice until the mixture is thick. This makes a good ½ cup of dressing.

Variations

Onion: Add ½ teaspoon of chopped onion to the cream before mixing.

Tomato: Fold in 1 tablespoon of tomato pulp to ½ cup of dressing.

Propagating Shrubs, Trees, and Plants by Half-ripe Cuttings

PROPAGATION by cuttings is a remarkably easy method of increasing stocks of a wide range of trees and shrubs cultivated in flower gardens in New Zealand. In this month's article for the flower gardener C. K. Ellis, formerly Horticulturist, Department of Agriculture, Dunedin, discusses the selection of cuttings, the time of taking them, and their preparation, insertion, and after care.

FOR several reasons cuttings are more satisfactory than seeds for propagating many plants. Cuttings are a form of vegetative reproduction and produce plants identical with those from which they are taken in a much shorter time than would be possible by raising plants from seed. Seeds, on the other hand, are the products of sexual reproduction and seedlings raised from them are seldom identical with the parent plants. Occasionally a plant may throw in one of its branches flowers of a different type or foliage of a different form. This phenomenon is usually known as "sporting" and may be perpetuated by taking and striking cuttings from the parts which show this variation in form. To endeavour to perpetuate such a "sport" from seed is difficult, because not only will there be great variation in the seedlings, but sometimes many years will elapse before the resultant seedlings are big enough to show their true characteristics. Finally there are those shrubs and trees which do not bear fruit and set seed until they have reached a considerable age and there are those, particularly hybrids, which never set viable seed.

[Jack Welsh and Sons photo.

A fine pendulous begonia in a South Island glasshouse. Begonias may be grown relatively easily from cuttings.

Selecting Cuttings

It is a mistake to select for cuttings pieces of wood from the most strongly growing parts of shrubs or trees. This type of wood is usually too soft and sappy, and unless a special propagating frame can be provided, the leaves wilt quickly after the cuttings have been made and inserted in the rooting medium and the cuttings ultimately die.

Shoots which show no symptoms of disease, are of normal growth, and exhibit all characteristics of the parent plants provide the best cuttings.

There are three main stages of wood maturity at which cuttings may be made. The most popular of these among home gardeners is probably the fully matured or hard-wood stage. Cuttings of this type are taken from shoots which have matured from wood during the current season. They are planted in the soil during early winter.

Soft-wood cuttings may be made from spring and early-summer growths from a wide variety of shrubs, but the incidence of "damping-off" with such cuttings under normal conditions is sometimes high and a great deal of attention must be paid to them to get reasonable results. Probably the most satisfactory cuttings are those known as half-ripe cuttings, which are taken from January to March from semi-matured wood of the current season's growth.

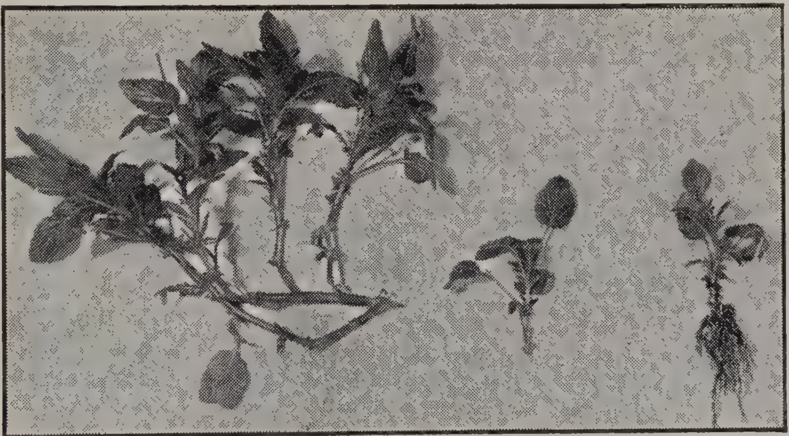
The best type of wood for making half-ripe cuttings cannot be readily described. It should be neither too young and soft nor too old and hard. The way to gain experience and learn which is the best type of wood is to take cuttings of varying age, thickness, and hardness and insert them at intervals of a week or 10 days and note which type gives the best results.

Climate and season are the two chief factors in determining the time at which cuttings should be taken. Special facilities for propagation, such as heating, also have a bearing on this aspect of the subject. Cuttings taken during January, February, and March, however, of most of the species suited to this type of propagation can be relied on to root with comparative ease.

Preparation of Cuttings

Many failures are caused through lack of attention and care in the preparation of cuttings. Experience in dealing with various types of shrubs rapidly brings success. The cut at the base of the cutting in most species must be made immediately below a node (where a leaf joins the stem). Clematis species and their varieties are the notable exceptions and from these inter-nodal cuttings must be taken. The length of the cutting is not very important provided two or three nodes are included, but with some species, such as ericas, strict adherence to such a rule as this is impossible, because the nodes are extremely closely spaced.

A very sharp knife is the best instrument to use in making the basal cut. It should be made with a single stroke, for the cleaner the cut the more readily will the wood callus and therefore the sooner will the cutting be given an opportunity to produce roots. Those cuttings which are too hard to be cut with a single stroke should be cut with one deeply sloping away from the node and be pared back to the required angle. Where the wood is brittle a notch may be


Old, straggling viola shoots (left) are not suitable for use as cuttings. They are best made from short, stocky growth (centre), usually found toward the centre of the plant rather than at the extremities of the laterals. The plant at the right was propagated from a cutting.

Christmas Cooking—

RECIPES *that* APPEAL

CHRISTMAS CAKE

1 lb. butter, 1 lb. sugar, 10 eggs, 1 heaped teaspoon *Edmonds Baking Powder*, 2 lb. flour, 1 lb. currants, 1 lb. sultanas, 1 lb. raisins, 4 oz. mixed peel, 4 oz. almonds (chopped), wine-glass brandy.

Beat butter to a cream, add sugar, then eggs one by one (unbeaten); mix baking powder with flour, and put in, then fruit dredged with flour, lastly brandy. Cook 4½ hours in moderate oven, 350°F.

CHRISTMAS PLUM PUDDING

1¾ lb. flour, 4 teaspoons *Edmonds Baking Powder*, 12 oz. breadcrumbs, 1½ lbs. chopped suet, 12 oz. brown sugar, 1 dessertspoon treacle (or more), 9 eggs, ½ teaspoon essence of lemon, 2 cups milk, 1½ lb. sultanas, 1 lb. currants, 1 lb. raisins, 8 oz. almonds (blanched), 8 oz. mixed peel, ½ packet spice, ½ level teaspoon salt, ½ nutmeg (grated), 2 tablespoons brandy.

Mix well dry ingredients, add fruit previously prepared, treacle, eggs well beaten, and lastly milk, essence and brandy. Darken with burnt sugar if desired. Put into scalded and floured pudding cloths or into well greased basins covered with scalded and floured pudding cloths. If divided into two, boil 8 hours: if into four, boil 6 hours. Serve with *Edmonds 'Sure-to-Please' Custard*.

HOME-MADE LOAF

4 cups flour, 1 teaspoon salt, small cold boiled potato, milk, or milk and water, 2 raised teaspoons *Edmonds Baking Powder* (Sure-to-Rise or Acto), ½ teaspoon sugar.

Sift together flour, sugar, salt and baking powder, then rub in potato. Add sufficient liquid (about a pint) to make a soft and smooth dough. Mix quickly, put at once into a greased tin ¾ full, smooth top with a knife dipped in melted butter, and bake immediately about ¾ to 1 hour in a hot oven (400°F.) Cover over with paper for first 10 or 15 minutes to prevent crusting too soon. When done, take from tin and wrap in a bread cloth until cold.

The name

EDMONDS

spells cooking success!

MERRY
CHRISTMAS

EDMONDS

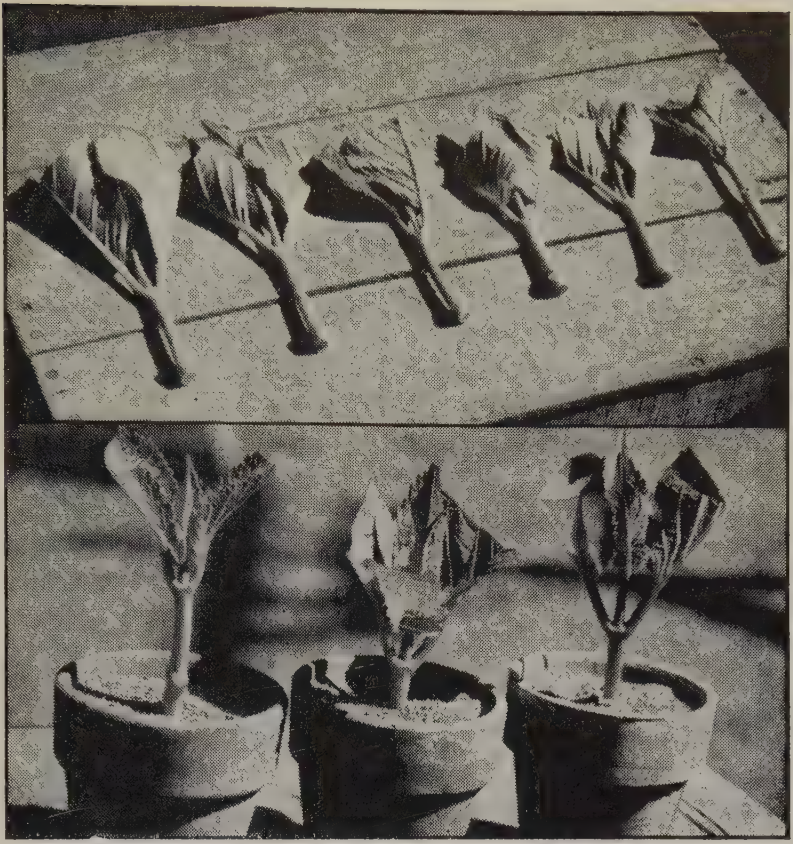
"Sure to Rise"

baking powder

EDMONDS
EDMONDS
PRIZE
BAKING POWDER

T. J. EDMONDS LTD., CHRISTCHURCH.

15.52



[*Green and Hahn Photography Ltd. photos.*

Hydrangeas strike readily. Upper—Well-prepared cuttings ready for insertion. Lower—Potted cuttings ready for plunging in sawdust or other bench material for growing on.

made opposite the start of the cut to prevent cracking or splitting when the final cut is made. A few of the lower leaves should be removed for convenience before the cutting is inserted in the rooting medium. Large leaves should have their tips cut off to prevent their falling down and lying on the surface of the rooting medium. All the leaves which will be below the surface of the medium should be removed and if the species being propagated is one which is apt to throw many suckers, the lower buds should also be taken off.

Rooting of Cuttings

A small frame erected on the bench of a glasshouse is the ideal place to root cuttings. A glass cover must be provided for the frame to prevent loss of moisture. If such facilities are not available, a good substitute is an outdoor cold frame, and failing this, good results can be obtained by placing a box containing about 6in. of the rooting medium in a sheltered place in the garden and covering it with a sheet of glass.

The most satisfactory medium in which to root cuttings of most tree and shrub species is one consisting of finely sieved, clean sharp sand, such as is available in beds of many rivers and streams throughout the country. This medium, however, can be used to best advantage only if the cuttings can be potted up immediately they have taken root, as the sand contains little or no plant food. Perhaps a better medium for the home gardener to use consists of equal parts of sand, loam, and leaf mould. All constituents must be mixed intimately and good drainage must be provided.

Hormone preparations that promote rooting are sold by most seedsmen, and if they are used, directions on the packages should be closely followed. They are particularly useful with some of the more difficult species to propagate from cuttings.

Insertion of Cuttings

The majority of cuttings do not need to be deeply inserted in the medium. They need be deep enough only to allow the compost to support them in an upright position and keep them adequately supplied with moisture. The hole in which to place the cutting may be conveniently made with a finger or with a dibble, but the base of the cutting must always rest firmly on the medium at the bottom; otherwise a pocket of air is left which interferes with proper callus and root formation.

Once the cuttings have all been placed, both they and the rooting medium should be watered thoroughly with a fine spray, thus ensuring that all the holes in the soil are filled and that adequate moisture is present. The lid of the frame should then be closed or the glass placed over the box, and if the cuttings are exposed to direct sunlight, a sheet of paper should also be placed over the top.

After Care

Generally cuttings take root most readily in conditions of mild temperature and high humidity. Gentle bottom heat is an added stimulus and is most beneficial to half-ripe cuttings. Wide fluctuations in temperature should be avoided. Occasional syringing during hot weather will be found very beneficial to the cuttings, for it maintains high humidity and makes up a great deal for water loss by transpiration. When syringing is done, however, aeration also should be good to reduce the possibility of rotting.

The frame should not be opened or the glass removed any more than is necessary for watering or for taking out cuttings that have rotted off, because such a practice leads to violent fluctuations in conditions and, most important, removes too great a quantity of moisture from the interior of the frame. A little permanganate of potash, the fungicidal properties of which help to control the growth of moulds or rots, should be added to the water occasionally.

Direct sunlight should not be permitted to fall on the cuttings, because it increases the transpiration rate to such an extent that wilting frequently occurs. A cutting which wilts seldom recovers.

According to the species being propagated, the length of time required for roots to form will be anything between 3 weeks and 3 months, but as soon as possible after roots have developed the new plants should be potted up or placed in good soil in boxes. They should be given pot or box room sufficiently spacious to accommodate the roots comfortably. If the soil mixture is not too rich, subsequent root growth will be rapid and extensive, and as the new plants make growth they should be progressively potted up to a stage where they are large enough and strong enough to be planted out in their permanent position. After they are potted up directly from the propagating frame, the new plants should be placed back in the frame or in a similar sheltered position for a few days until they recover from the operation.

Garden Work for January

Biennial plants such as wallflowers, sweet williams, and myosotis may be raised from seed sown during January in the warmest districts in a partly shaded place. The seedlings should be pricked out a few inches apart in nursery beds where they can develop well and be ready for planting into the borders for next season's flowering.

Bulb planting will begin in the earlier districts in February and the gardener should now be considering what types and varieties to buy. The best stocks are always sold rapidly at the beginning of the planting season. If the bulbs have to be stored for a while before planting, they should be kept in a cool and dry place.

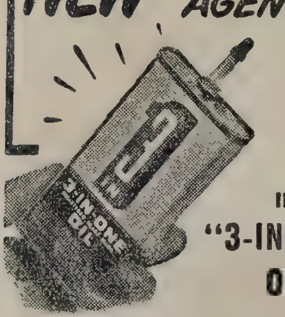
Compost, provided it is well matured, should be worked into the ground at regular intervals. It is very valuable in improving the soil texture and improving the water-holding capacity of the soil. The material should be sieved through a ½in. riddle and the coarse parts returned to the heap for further rotting. The fine material should be spread evenly over the borders and lightly forked in.

SPEEDWAY STERILISER

BURNS OIL OR WOOD

Write for free illustrated catalogue to Speedway Products Ltd., 26 Albert St., Auckland.
South Island Distributor: A. H. Turnbull & Co. Ltd. Christchurch.

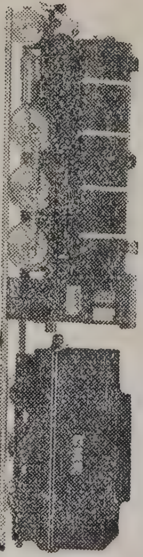
SS-1-2 STEAM & BOILING WATER



NEW ANTI-RUST AGENT!

IN **"3-IN-ONE" OIL**

NEW discoveries have now made "3-IN-ONE" Oil better than ever! New rust-inhibiting agent, greater penetrating power and balanced viscosity make "3-IN-ONE" Oil the ideal lubricant and rust inhibitant around the home, office, workshop and garage. Buy a can to-day!



STEAM LOCO

Runs 15 min. on one fill.

The new CRANKO 'MOGUL' is a very powerful 'O' gauge live-steam locomotive with pony truck and 6 coupled wheels driven by twin oscillating cylinders. Combined speed control and reverse lever. Exhaust steam escapes from chimney in realistic puffs. Enamelled black with brass fittings and trimmings. Runs on 2ft. radius curves. Overall length with 6-wheeled tender, 16 inches.

Price with tender, £7/10/-

Send stamped, addressed envelope for price list of CRANKO steam and electric trains, boats, engines, etc.

MOVIE MODELS

Engineers and Model makers
Havelock North, Hawkes Ba

"GRASS-GRUB AND GRASS CATERPILLAR CONTROL"

The habits of grass-grubs and subterranean grass caterpillars and control measures against these pests are outlined in Bulletin No. 244, "Grass-grub and Grass Caterpillar Control". The bulletin is available free from the nearest office of the Department of Agriculture.

DESOUTTER

Electric and Pneumatic PORTABLE POWER TOOLS

Additions to the range are the

TWO SPEED ½in. ELECTRIC DRILL
TWO SPEED ⅝in. ELECTRIC DRILL

FEATURES: High and Low Speed — over .35 h.p.
Weight approx. 10lb.

N.Z. Agents

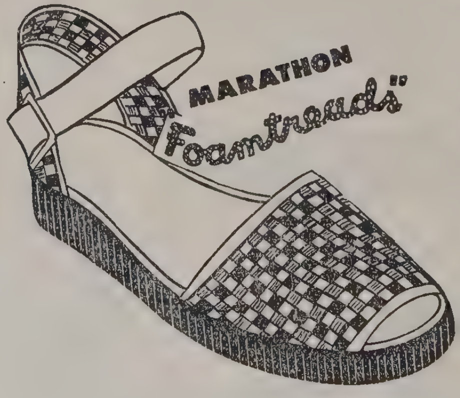
de PELICHET, McLEOD & CO. LTD.
P.O. BOX 205 - - - - - - - - - - - HASTINGS

America's . . BIGGEST SELLING CASUAL SHOES NOW COME TO NEW ZEALAND

Smart and Colourful Styling plus the exclusive bubble sole make 'Marathon' Foamtreads the perfect shoe for Summer casual wear.

"MARATHON Foamtreads"
For "THE WALK THAT RELAXES"

Reg. N.Z. Patent No. 105820.



Marathon Foamtreads offer you the style you want plus the comfort you have dreamed of.

AT ALL RETAILERS.

Made by Marathon Rubber Footwear Ltd., Christchurch under licence from Ro-Search Inc., U.S.A.

Chrysanthemums will be growing strongly by January and attention should be given to staking and tying. As soon as the clump of shoots is well developed a tie should be made right round the plant to prevent the small side branches being blown off by winds. Late-flowering varieties should be stopped again by pinching the tips out of the shoots. This encourages branching and a greater number of flowers.

Cuttings of a great variety of herbaceous plants and shrubs can be taken now and rooted in a cold frame or under a bell jar in the open, provided it is in a shady situation. An inverted glass jar or a box with the top and bottom out and a sheet of glass over it will probably do just as well. The object with soft cuttings is to prevent wilting during the first few days after their insertion in the rooting medium (usually soil), and this is achieved by maintaining high humidity in the cold frame, bell jar, or whatever is used. A few of the plants which can be propagated in this way are sweet williams, pentstemons, antirrhinums, hybrid wallflowers, perpetual flowering carnations, and many shrubs, including buddleias, salvias, conifers, and hydrangeas.

Cyclamen are extremely useful winter-flowering pot plants for the house and are not hard to grow. However, the raising of good plants from seed requires a long period, about 18 months. The home gardener is advised to purchase a plant in bloom from a reliable seedsman. After the flowers have faded in spring the plant should be gradually dried off and allowed to rest in a cool place outside until January, when it is started into growth again by knocking it out of the pot with its ball of soil and repotting. In repotting, most of the old soil should be knocked off and replaced with fresh potting soil. Plenty of crocks should be placed in the bottom of the pot to ensure good drainage. The corm is set almost on top of the soil, only its basal part being buried. Flowers of sulphur sprinkled over the top of the corm will reduce any tendency to rot. The plants should now be thoroughly watered and stood in a cool, shady place to await signs of growth.

Dahlias grown for show blooms may need to be fed with weak liquid manure. It is not necessary to feed plants grown for normal border displays, as these should succeed quite well if the soil has been properly prepared.

Freesias are excellent pot plants for the house during winter. Eight or ten bulbs can be potted in a 4in. pot. A good potting mixture consisting of 7 parts by bulk of loam. 3 parts by bulk of peat or leaf mould, and 2 parts by bulk of sharp sand should be used. To each bushel of this mixture should be added 1½oz. of dried blood, 1½oz. of superphosphate, ½oz. of sulphate of potash, and ¾oz. of carbonate of lime. After potting, the pots should be plunged into the soil in a cool part of the garden and watered thoroughly. A covering of ashes or light soil about an inch deep should be spread over the top of the plunged pots. When the shoots appear above the covering the pots should be removed and cleaned and taken to a sunny position in the house, where the freesias will bloom.

Gaillardias bloom freely and make a bright show, especially in hot, dry weather and poor soils where few other flowers will flourish. Seed of these plants can now be sown and the seedlings later transplanted to warm, well-drained, sunny sites in the border. It is possible to multiply gaillardias by digging the plants in the autumn and cutting the fleshy roots into pieces about 2in. long, making sure that the end of the cutting which was nearest the crown is cut off square. The cuttings should be placed upright about 3in. apart in sandy soil with the square end slightly below the surface of the soil. By spring they will have developed roots and buds and may be transplanted to the borders in the usual way.

Red-hot pokers (*Kniphofia* spp.), among the showiest herbaceous plants, flower during summer and autumn.

Herbaceous perennials in the borders should be staked securely as soon as necessary. The criterion of good staking is a garden undamaged after a gale, yet with few strings and ties showing. Plants with massive and heavy flower heads, such as lilies, will grow unsupported for a considerable time, but should be securely staked by the time the flower buds appear.

Hollyhocks can be used effectively near the house to break the lines of bare walls. Plants are best raised from seed sown each year during summer, because young plants are less susceptible to attacks by rust fungi. With old infected plants the rust spores persist from year to year round the crown at the base of the plants. If the typical brown spots of rust appear on the leaves, they should be sprayed at once with a spray containing 2 fl. oz. of lime sulphur and ½oz. of colloidal sulphur to 2 gallons of water. Should the plants be near a painted wall, the paintwork should be protected with newspapers or a cloth while they are sprayed, for sulphur will discolour the paint.

Hydrangeas root readily from cuttings taken from the new shoots at this time of year. Cuttings should be cut off neatly immediately below a bud 3in. or 4in. from the tip and inserted in sand in a cold frame. They should be well watered and covered with a sheet of paper to prevent the entry of bright sunlight, and the atmosphere within the frame should be kept constantly moist. The bottom few leaves from each cutting may be removed for convenience of handling.

Iceland poppies may be planted now, though recent experience has shown that later plantings made in February and March are less susceptible to spotted wilt attacks. Seed may be sown in January in boxes kept in a shady position and covered with paper until the seedlings are showing through the soil. As soon as the seedlings are big enough to be handled they should be pricked out into boxes about 2in. apart and later planted into a well-limed bed which has not recently been manured. Plantings made at this time of year will flower late next winter.

Kniphofias, popularly known as red-hot pokers or torch lilies, flower during summer and autumn. They will succeed in comparatively poor soils and dry situations, though they are most frequently planted near pools. They respond well to cultivation and regular dividing every third year.

Lawns should be given their quarterly dressing of fertiliser, provided the weather is not too dry. If grass growth has ceased through drought and the lawns are brown, the feeding should be delayed, as the fertiliser tends to delay recovery of the grasses. The dressing consists of 3 parts of sulphate of ammonia, 1 part of superphosphate, and 1 part of sulphate of iron applied at the rate of 1oz. per square yard.

Meconopsis betonicifolia (Himalayan blue poppy) thrives in well-shaded places in the cooler parts of New Zealand and makes an attractive summer display among shrubs and trees. The plants should never be allowed to suffer from drought. The seeds germinate best if sown immediately after ripening and this occurs about January and February. They should be sown in boxes or pots in a shady position and be planted out as soon as the seedlings are large enough.

Peonies are herbaceous plants which normally flower in early summer. They should not be moved more than necessary once they have become established, for they take a season or two to recover. but evergreen clumps which are many years old should be lifted and divided early in the new year immediately they have finished flowering. Each clump is carefully lifted, the soil removed, and the fleshy roots cut into a number of pieces, each with a crown, and replanted.

Proteas are excellent decorative plants and should be more widely grown in this country. They are grey-leaved evergreens suitable for well-drained, sunny positions. They are extremely tolerant of drought. The flowers are conspicuous and, though not really beautiful, attractive. The gardener should at this time of year observe some of the more popular protea species with a view to deciding which ones he could eventually grow in his own garden.

Rambler roses such as Dorothy Perkins which have finished flowering before the end of January should also by this time have produced a number of vigorous new shoots from the base of each plant. Branches which have flowered should now be cut out and the new shoots be tied in to take their places.

Rose blooms should be cut with long stems, as this encourages the growth of new shoots and prevents the bushes from becoming straggly. Faded flowers should be removed by cutting their stems back to the nearest bud or strong shoot rather than simply by removing the flower head itself.

Rock gardens should be overhauled at this time of year, all dead flower heads and pieces of straggly growth being removed. The full beauty of a rock garden can never be appreciated if it is not kept tidy.

Sweet peas should not be allowed to run wild after their original training in early summer. If dead flower heads are not removed regularly, flowering will soon cease.

Sow seeds during January of annuals for autumn planting. These include winter-flowering pansy, Brompton stock, stock "Beauty of Nice", cinerarias, and wallflowers. At this time of year flower seeds are best sown in boxes or pots in a cool, shady place and left there until after germination. It is easier by this method to keep the seed soil constantly moist. Topdressing in the flower borders with ½oz. of sulphate of ammonia and ½oz. of superphosphate per square yard is very useful where particularly fine flowers are desired. This dressing should not be given if good dressings of flower-border fertilisers were given during spring.

Violas and pansies will by now have grown straggly and will be exhausted through continuous flowering. The plants should be cut back to within an inch or two of the ground to encourage them to send up new shoots, which will probably provide valuable flowers during autumn. A few plants may be left to provide cuttings which can later be rooted in the cold frame.

Seasonal Troubles

Cultivating the soil thoroughly where bulb foliage has died down will do much to reduce the possibility of attack from narcissus fly by making it difficult for the young larvae to find their way to the bulbs. When narcissi bulbs are lifted they should not be left lying about the garden, as this provides opportunity for the flies to lay their eggs directly on them. All bulbs that feel soft should be destroyed by burning, as they are probably infected.

Rose mildew is probably the commonest disease of roses in this country. It attacks particularly severely where there is a lack of good circulation of air about the plants; for example, on rambler roses growing against a wall. This disease can be controlled reasonably well by regular dusting with flowers of sulphur. A convenient method of dusting is to place some flowers of sulphur in a small bag made of fine muslin and to hold this close to the plants and tap it sharply with a stick. This provides clouds of sulphur dust which reach most parts of the plant.

Thrips are slender insects up to ⅛in. long and vary in colour from yellow to black. Their attacks are particularly severe on gladiolus. Regular spraying with nicotine sulphate (1 part in 800) plus summer spraying oil (1 part in 100) will usually control this pest successfully. D.D.T. dust will also be found effective.

Caterpillars of the magpie moth (woolly bears) will now be attacking cineraria leaves, looper caterpillars will be eating geraniums and other plants, and leaf-roller caterpillars will be commonly seen. They can all be controlled by hand picking and by dusting with derris or D.D.T. dust.

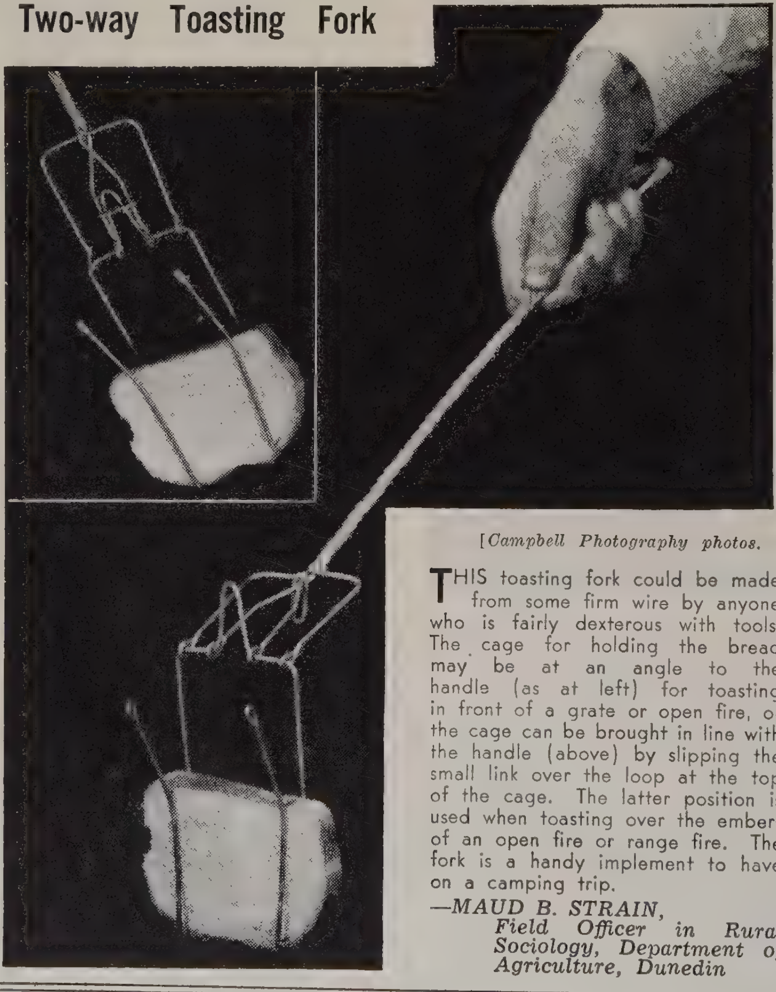
Geranium rust, which disfigures geranium plants by producing rust-brown spots on the leaves, can be controlled by regular spraying with 2 fl. oz. of lime sulphur and ½ fl. oz. of colloidal sulphur to 2 gallons of water.

Greenflies will still be common and should be sprayed at 10-day intervals with nicotine sulphate at the rate of 1 fl. oz. to 4 gallons of water plus 6 fl. oz. of summer spraying oil until all traces of the pest have disappeared.

Subterranean grass caterpillar, larva of the large nocturnal porina (*Oxycanus*) moth, often ruins lawns by eating the grass and leaving large bare patches during summer. Poison baits have been found most effective in controlling this pest. Sufficient to broadcast over 1500 sq. ft. can be made from 2lb. of wheat bran mixed thoroughly with 2oz. of arsenate of lead powder, or 1oz. of paris green moistened slightly. The application should be made on a fine, warm evening. Both arsenate of lead and paris green are extremely poisonous substances and the greatest care should be exercised in using them, especially where there are children or pets. The treatment can be repeated during February if the attack is serious. An alternative to the laying of baits is spraying with arsenate of lead at the rate of 3lb. of paste or 1½lb. of powder per 100 gallons of water.

◆

Two-way Toasting Fork



[*Campbell Photography photos.*

THIS toasting fork could be made from some firm wire by anyone who is fairly dexterous with tools. The cage for holding the bread may be at an angle to the handle (as at left) for toasting in front of a grate or open fire, or the cage can be brought in line with the handle (above) by slipping the small link over the loop at the top of the cage. The latter position is used when toasting over the embers of an open fire or range fire. The fork is a handy implement to have on a camping trip.

—*MAUD B. STRAIN,*
Field Officer in Rural Sociology, Department of Agriculture, Dunedin

Equipment and Planning for an Ideal Kitchen

THE best equipment does not, of itself, make an ideal kitchen; careful arrangement is also necessary. In the kitchen described in this article by Eirene E. Unwin, Field Officer in Rural Sociology, Department of Agriculture, Christchurch, four major pieces of equipment, a dishwasher, a refrigerator, an electric beater, and an electric range, were moved from their original, not very convenient positions in the large kitchen-dining-room of a farm home and transferred to a smaller room; ample and convenient bench and storage space was built in, and these changes resulted in an ideal kitchen.

IN the new kitchen the housewife can work undisturbed by cross traffic through the room and is saved much walking between working areas and storage space, and the larger room is now free of the paraphernalia and disturbance of meal preparation and is a comfortable dining-living-room. The new kitchen occupies one end of a former spare bedroom, the other end of which has been fitted up as a sewing-room with a convertible bunk-couch, so that even the spare sleeping accommodation has not been lost.

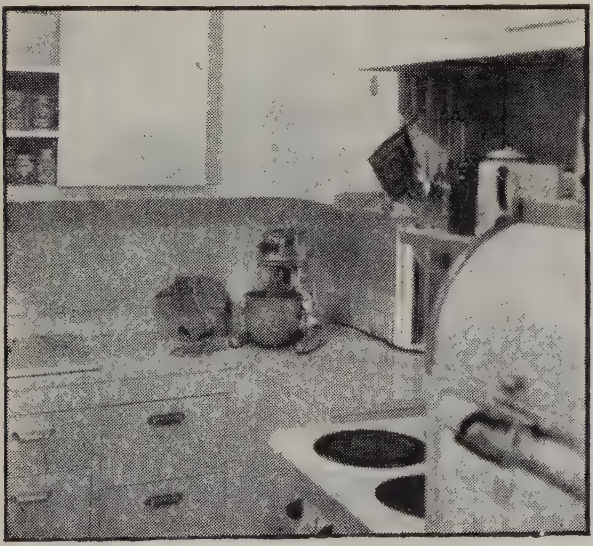
[*C. E. Clarke photo.*

Section of the new kitchen, showing, at left, the large refrigerator and the safe with ample shelf space and room for hanging meat. The steel sink has a swinging mixer tap, and cupboards have been built above both the refrigerator and the sink bench.

The plans and photographs accompanying the article tell most, but not all, of the story. Study of Plan 1 does not give full realisation of how much extra walking across the large room, which is 15ft. 6in. x 21ft., was necessary when the housewife went to the refrigerator. She had probably become used to the inconvenience of having to skirt the table and chairs and delve behind the armchair, but the extra walking necessary to reach the refrigerator must have added up to many miles in the year. Also, this inconvenience would no doubt have meant that certain articles in constant use were not habitually kept there because it would be too far to go and get them every time they were needed. Altogether, therefore, the physical energy expended in using the refrigerator and regret that it was not more conveniently placed must have added considerably to weariness at the end of each day.

This question of the placing of a new refrigerator is often a problem, for if there is no place convenient either to the dining table or the meal-preparation centre, much of the refrigerator's value is lost. Therefore, when any new kitchen or kitchen renovation is being planned it is essential to allow sufficient space for a possible refrigerator in the most suitable position. This is a wise precaution, even if the buying of the refrigerator is still nothing but a dream.

The awkward placing of the refrigerator in the kitchen described was the greatest inconvenience in it, but a further difficulty was that the china and general storage cupboard was on the wall opposite the range and baking bench, 15ft. away, and this also entailed much extra walking round the end of the table, and the crossing of the main traffic line from the back door. Also, people going through the room must often have got in the way of the route to and from the refrigerator.


[*C. E. Clarke photo.*

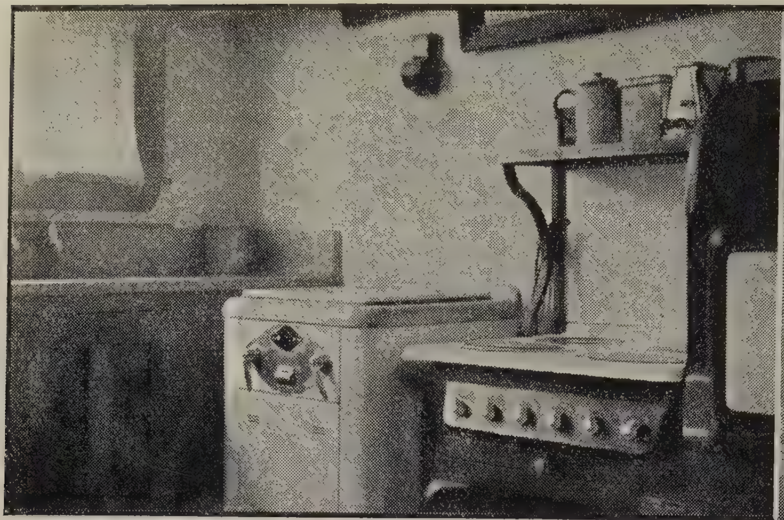
The convenient cooking and serving corner of the new kitchen, with the bins, marble slab, grocery cupboard, electric beater, and electric jugs within easy reach. The false cupboard above the stove disguises the hood for drawing off steam and cooking odours.

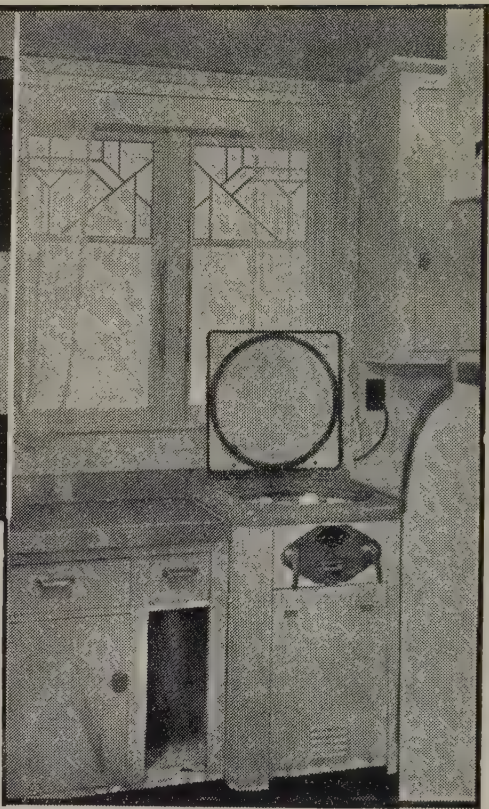
In the new plan all this is changed, and there are many other conveniences in the new, compact kitchen, which measures 13ft. 6in. x 9ft., the spacious dining-room, and the well-fitted sewing-room.

The Kitchen

In the kitchen as it is now arranged the refrigerator is close to the meal-preparation area, and is also convenient to the dining table. Next to the refrigerator is a large safe, built projecting from the outside south wall of the house and with a small outside door so that the milk, cream, and garden produce may be put into it directly from the backyard. The former terrazzo sink bench was too long for the new kitchen, so it was transferred to one of the farm cottages. A shorter, stainless-steel sink bench has been installed and the dishwasher fitted in next to it. A small cupboard has been built over the sink and another over the refrigerator. In the cupboards under the sink bench a special compartment has been left for the wire baskets belonging to the dishwasher. Formerly they had to be kept under the stove or somewhere equally awkward, and tended to get in the way when the dishwasher was not in use. China is stored in the cupboard above the bench to the right of the dishwasher, so that it can be put away directly it is dried.

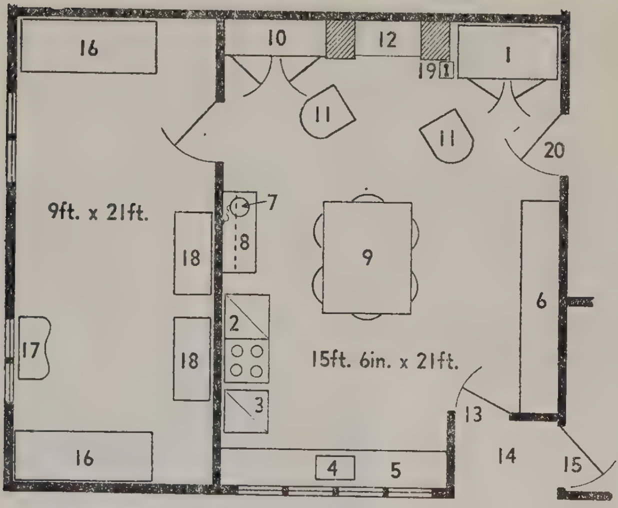
The range from the old kitchen has been installed in the new kitchen, back to back with its former position, very little new electric wiring being needed. A ventilating hood above the stove takes off smells and steam. A bench extends along the remaining wall space from the hot-plate side of the range round to the dishwasher. Below it are cupboards, drawers, and bins, with a recessed toe space next the floor; above it shallow cupboards line the walls. The white-enamelled bench is continuous, but the spaces beneath the corners and in the corners of the upper



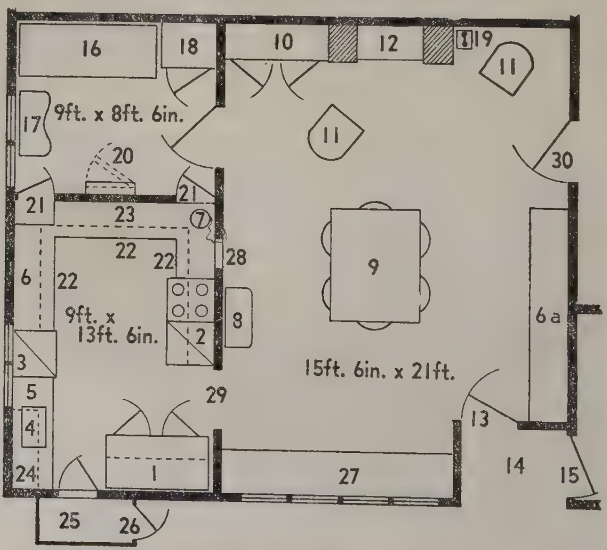


[*Photograph at right by O. E. Clarke.*

A contrast in arrangement. Above—The sink, with a terrazzo bench, dishwasher, and stove in the old kitchen. Right—The same dishwasher and stove were used in the new kitchen, but a new stainless-steel bench and sink were installed. The original window supplies light for the whole room. Cupboards, drawers, and a compartment for the dishwasher cage are built under the sink bench. The dishwasher fits closely between the sink bench and the working bench at the right, leaving no awkward spaces to clean. There is a recessed toe space at the base of cupboards right round the room. The side of the stove is visible at the right of the illustration.



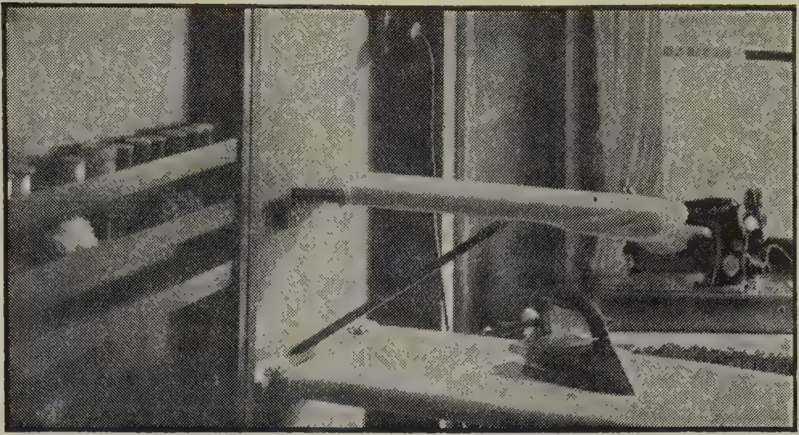
Plan 1: Before alterations. 1—Refrigerator. 2—Electric range. 3—Dishwasher. 4—Sink. 5—Terrazzo bench. 6—China cupboard. 7—Electric mixer. 8—Sideboard with bins beneath. 9—Dining table and chairs. 10—Water cylinder cupboard. 11—Armchairs. 12—Open fireplace. 13—Back door. 14—Back porch. 15—Outside door to bathroom. 16—Beds. 17—Dressing table. 18—Compactums (drawers and hanging cupboard). 19—Telephone. 20—Door to passage.



Plan 2: After alterations. 1—Refrigerator with cupboard above. 2—Electric range with canopy and cupboard above. 3—Dishwasher. 4—Sink. 5—Stainless-steel bench. 6—China cupboard. 6a—Storage and book cupboard. 7—Electric mixer. 8—China cupboard. 9—Dining table and chairs. 10—Water cylinder cupboard. 11—Armchairs. 12—Open fireplace. 13—Back door. 14—Back porch. 15—Outside door to bathroom. 16—Divan-bunk. 17—Dressing table (now storing sewing machine). 18—Built-in wardrobe with cupboard above. 19—Telephone. 20—Ironing board cupboard. 21—Cupboards. 22—Work bench. 23—Storage cupboards above work bench. 24—Storage cupboards above sink bench. 25—Safe. 26—Small outside door to safe. 27—Window seat with drawers beneath. 28—Slide. 29—Doorway (sliding door). 30—Door to passage.

cupboards, which are not easily accessible from the kitchen, are utilised as cupboards opening into the sewing-room on the other side of the new dividing wall. The electric beater stands on one corner of the bench, again almost back to back with its former position and using much the same electric wiring. Above the bench, immediately to the left of the hot-plates, a slide has been cut in the wall, a very convenient arrangement, as meals can be dished straight off the stove and served through the slide, whereas the dirty dishes are brought to the sink through the doorway.

The cupboards provide ample storage space for all the stores and equipment needed by the housewife during the preparation of any meal and the clearing-up after, and because they are all in the one small room, the minimum of walking is necessary. The bench space is ample at the sink and the dishwasher for stacking dishes, along the side wall for general work, along the end wall for baking, and near the stove for serving. A marble slab formerly on the dresser has been placed on the end bench, above the bins, and as the dry stores are in the cupboard above and the electric beater is in the adjacent corner, this forms a compact baking centre which is only about two steps from the range.



[C. E. Clarke photo.

Equipment in the new sewing-room. The ironing cupboard open and the ironing boards ready for use. When not in use the ironing boards fold up against the wall and the door containing the racks for sewing equipment closes over them.

The Dining-room

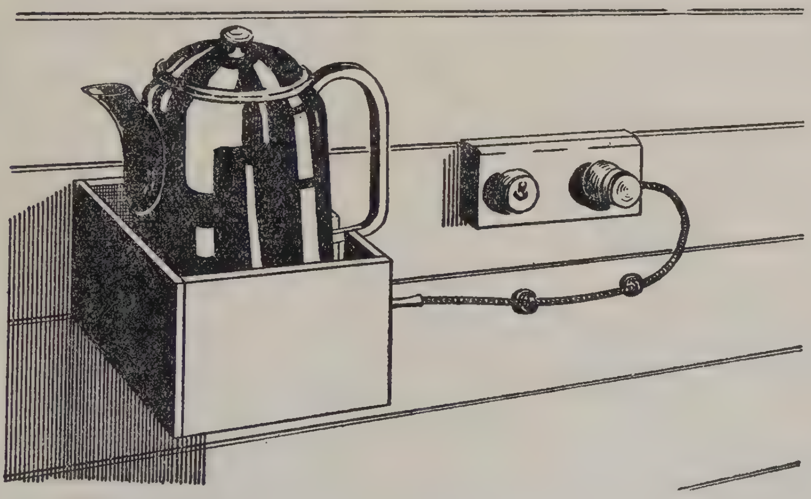
In the dining-room a long cushioned seat has been built into the space formerly occupied by the sink bench. The old china cupboard is used for general storage and as a bookshelf. As the family's books and magazines are many and varied, doors on the bookshelves are an advantage. With the refrigerator out of the corner there is ample space for the easy chair on the right-hand side of the fireplace by the telephone. Occupants of this chair are no longer constantly disturbed by someone coming to the refrigerator or coming in through the door from the hall. A small glass-fronted cabinet, for the best china, is against the wall between the slide and the door to the kitchen, completing the transformation of the room to a dining-living-room. The new door between the two rooms was made to slide into the thickness of the wall between the refrigerator and the window seat, as a hinged door would have been awkward, whichever way it opened.

The Sewing-room

That end of the former bedroom now fitted up as a sewing-room is a great boon to the housewife. It is surprising how often the demands of sewing are completely overlooked when the interior fittings of a house are being planned. That had been the case in this house, but now an excellent sewing-room which can be used as a spare bedroom has been fitted up in a space 9ft. x 8ft. 6in. The door into the original bedroom is being used, and along the new dividing wall between the kitchen and sewing-room, storage cupboards and an ironing cupboard have been built. The storage cupboards utilise the space in the corners of the kitchen, as already mentioned. The ironing cupboard is only 9in. deep and contains let-down skirt and sleeve boards, an electric plug for the iron, and racks on the door for threads, scissors, measuring tape, and other equipment. The electric sewing machine is by the window. Along the right-hand wall of the room is an upholstered divan, the back of which hinges up to form an upper bunk when the room is to be used as a bedroom. In the corner behind the door there is a large wardrobe, and drawers are built into the space beneath the divan. The only work not catered for in this sewing-room is cutting out, but the large dining table in the next room could well be used for this purpose.

A simple description of this renovation cannot really do justice to the excellent planning that has gone into making this nearly perfect kitchen and compact, well-fitted sewing-room. After more than a year's use one minor drawback only has been revealed—the sewing-room is a little too small. From the photographs and plans it is possible to get a better idea of the layout. It should be encouraging to all New Zealanders to know that this is the kitchen of a farm home in South Canterbury, and it is as good as or better than a great many of the "model dream kitchens" which figure so often only on the pages of American magazines. If it has been done once, it can be done again. A further careful study of the plans and illustrations should prove well worth while to anyone interested in having that "dream kitchen" come true.

Safety with Electric Jugs



THE trailing cord of an electric jug has been the cause of many injuries to children. The simple home-made safety device illustrated may prevent a fatal scalding. A wooden box is made to enclose the jug partially, so that even if the cord were left dangling from it, the jug could not be pulled over. An added precaution, however, is to keep the cord well out of reach by securing it to the wall with insulated cup hooks.

The New Zealand Journal of Agriculture

Volume 84, July-December 1952

INDEX

July 1-96, August 97-192, September 193-272, October 273-368, November 369-464, December 465-560

A

Abnormal Eggs in Household Poultry, 223.
Adam, G., and Elliott, I. L.—Peppermint Oil Production Trials, 240.
Aeroplanes, Topdressing, Flight Strips for, 64.
Agricultural Bureaux, Commonwealth, 306.
Air-flow Meter for Testing Milking Machines, 213.
Allo, A. V.—Paspalum in Bay of Plenty District, 57.
Animal Imports, Stricter Control of, 496.
Animals, Farm, Tuberculosis of, 8.
Apiaries, Good Siting of, 225.
Apples, Common Faults in Packing of, 526.
Apples, Stuffed Sausage, 358.
Arnold, E. H.—Phosphates and Pasture Production, 443.
Arthur, H. A.—Modified Mole-drain Plough, 20.
Ashley County, 418.
Aspic Makes Appetising Dishes, 86.
Auckland, South, Basic Slag Responses in, 327.
Australia, Developing Sand Country in, 346.

B

Baby's Dress and Matinee Jacket, 191.
Baby, Towelling Hood for, 192.
Bail, Elevated, System of Milking, 101.
Baled Hay, Improved Sledge for Stooking, 227.
Ballinger, C. E.—Sugar Beet as Winter Supplement for Pigs, 202.
Barley, Malting, Variety Trials in Ellesmere County, 479.
Barrer, P. R.—Malting Barley Variety Trials in Ellesmere County, 479.
Basic Slag Responses in South Auckland, 327.
Bates, E. M.—Haymaking, 317.
Batt, W. G.—Elevated-bail System of Milking, 101.
Bay of Plenty, Paspalum in, 57.
Bedding Plants in Flower Garden, Raising, 361.
Bee Colonies, Domestic, Spring Examination of, 239.
Bee Colonies in a Domestic Apiary, Increasing the Number of, 441.
Bee Colony Requirement, Domestic, during Honey Flow, 509.
Bee Combs, Importance of Good, 329.
Beekeepers, Responsibilities of, 131.
Beekeeping Legislation, 131.
Bell, J. E.—Responses to Basic Slag in South Auckland, 327.
Belt Drives, Care of, 208.
Belworthy, W. R., and Bobby, F. C.—Need of Vitamin A in Diet for Laying Pullets, 293.
Bench and Sink, Kitchen, Choosing a, 367.
Berry-Smith, F.—Grape Growing in Home Garden, 401, 521.
Bledisloe's, Viscount, Champion Bull, 376.
Bluestone Absorbed by Wool Affects Processing, 501.
Bobby Calf Pen, 56.
Bobby, F. C., and Belworthy, W. R.—Need of Vitamin A in Diet for Laying Pullets, 293.
Book Reviews, 56, 124, 150, 160, 212, 308, 408, 432, 483, 485, 496, 520.
Branding, Wool, Excessive, 106.
Brands in Wool, 303.
Brash, A. G.—Scrapie Disease, 305.
Briscoe, D. A.—Constructing a Honey-house Bogey, 61, 396.
Broodiness in Household Poultry, 223.
Browning, H. A.—Row Crop Cultivation, 505.
Budding and Grafting Equipment, Portable Stand for, 126.
Burgess, A. C.—Silage Making, 237.
Burrell, J. P., and Owtram, I. H.—Planting Shelter for Pigs, 475.
Butter and Cheese, Export, Grading Points for, 486.

C

Cake, Russian Slice, 96.
Cakes, Sponge, 178.
Calf Pen, Bobby, 56.
Canadian Outbreak of Foot and Mouth Disease, 338.
Carnation Culture, Commercial, on Coromandel Peninsula, 253.
Carnations, 269.
Cauliflower Mosaic, 507.
Cheese and Butter, Export, Grading Points for, 486.
Chickens in Household Flocks, Rearing and Feeding, 17.
China, Selection and Care of, 353.
Christmas Cards, 359.
Christmas Pudding, 356.
Citrus Orchards, Shelter in, 135.
Claridge, J. H.—Early-potato Production, 35.
Clothes, Summer Play, for Girls or Boys, 444.
Clover, Threshing of, 505.
Colour in the Home, 93.
Comer, R. M.—Protecting Ryegrass Seed from Weather, 524.
Commonwealth Agricultural Bureaux, 306.
Conway, T.—Thinning of Peach Fruits, 389.
Coromandel Peninsula, Commercial Carnation Culture on, 253.
Couston, Eleanor—
- Choosing a Kitchen Sink and Bench, 367.
- Home Science School, 540.
- Preserving Nutrient Value of Vegetables, 263.

Crawford, W. G.—Fruit and Vegetable Cropping in North Otago, 55.
Creep, Importance of, in Pig Production, 63.
Cromesquis, 262.
Crop Rotation in Home Garden, 65.
Crops and Pastures, Spring-sown, 143.
Crops and Silage, Production of, 237.
Crops, Horticultural, Irrigation of, 23.
Crops, Mechanical Inter-row Cultivation of, 314.
Croquettes, 262.
Crosbie, C. J.—
- Field Loader for Bulk Lime, 105.
- Mechanical Inter-row Cultivation of Crops, 314.
- Preventing Fires in Harvesting Machinery, 495.
- Threshing of Clover, 505.
- Twelve Killed by Tractors in 1951, 466.

Cruickshank, I. A. M.—Rust of Linseed and Linen Flax, 123.
Cultivation, Row Crop, 505.
Cuttings, Half-ripe, Propagating Shrubs, Trees, and Plants by, 549.

D

Dairy Factory Grading Points, 486.
Dairy Farming in New Zealand, Intensity of, 288.
Dairy Herd Replacements, Selection of, 133.
Dairy Produce Graded for Export during May, 34; during June, 142; during July, 236; during August, 316; during September, 416; during October, 504.
Davison, R. N.—Plant Injury Caused by Hormones, 319.
Dawe, T. C. R.—Growing Peas for Canning in Pukekohe, 229.
Department of Agriculture, History of, 371.
Department of Agriculture, 60 Years' Service by, to Farming 370.
Dishes, Tea, Can be Prepared in Advance, 537.
Domestic Apiary, Increasing the Number of Colonies in a, 441.
Domestic Bee Colony Requirements during Honey Flow, 509.
Domestic Beekeeping Notes, 239, 307, 441, 509.
Drain Maintenance, 143.
Dress and Matinee Jacket, Baby's, 191.
Ducks, Household, 347.
du Faur, R. T., and Scott, R. H.—
- Farming Potential as Guide to Land Planning, 144.
- Fat-stock Production Survey of Wairoa County, 241.

Duncan, J. E.—Brands in Wool, 303.
During, C.—Nitrogenous Fertiliser Trials, 233.

E

Early-potato Production, 35.
Egg Eating in Household Poultry, 224.
Electric Fencing, Installation and Maintenance of, 409.
Electric Jugs, Safety with, 557.
Ellesmere County, Malting Barley Variety Trials in, 479.
Elliott, I. L., and Adam, G.—Peppermint Oil Production Trials, 240.
Ellis, C. K.—Flower Garden Notes, 87, 183, 269, 361, 449, 549.
Embroidery, Drawn-thread, 82.
Export Fruit, New Method of Handling, 494.
Ewes, Sleepy Sickness and Milk Fever in, 115.

F

Fabrics, Rayon, 544.
Faithful, W., and Saxby, S. H.—Developing Ploughable Tussock Grassland in Southland, 46.
Farming in New Zealand: Ashley County, 418.
Farming in New Zealand other than Dairy or Sheep Farming, 484.
Farming in New Zealand, Types of, 159, 234, 288, 386, 484.
Farming, 60 Years' Service to, 370.
Fat-stock Production Survey of Wairoa County, 241.
Feather Eating in Household Poultry, 224.
Fences, Hawthorn, Mechanical Cutting of, 399.
Fencing, Electric, Installation and Maintenance of, 409.
Fertilisers, Home Garden, 161.
Fertiliser Table, Home Garden, 535.
Firearm Accidents, 16, 134, 216, 333.
Firearms, Using, Safely and Skilfully, 19.
Fires in Harvesting Machinery, Preventing, 495.
Flight Strips for Topdressing Aeroplanes, 64.
Flower Garden Notes, 87, 183, 269, 361, 449, 549.
Flower Garden Soil, Sterilising, 361.
Flowering Plants for Indoor Display, Growing, 87.
Foot and Mouth Disease, 339.
Foot and Mouth Disease, Menace of, 99.
Foot and Mouth Disease, Symptoms of,6.
Fork, Two-way Toasting, 554.
Fruit and Vegetable Cropping in North Otago, 55.
Fruit Grader, Attachment to Improve Feed of Screw-type, 500.
Fruit, New Method of Handling Export, 494.
Fruits, Peach, Thinning of, 389.
Fry, P. R.—Cauliflower Mosaic, 507.
Fuller, C. E. K.—
- Commercial Carnation Culture on Coromandel Peninsula, 253.
- Home Orchard in Summer, 497.

G

Garden Pools, 449.
Gardens, Home Vegetable, More Produce from, 3.
Garden, Vegetable, Planning, 65.
Gerring, J. C.—Sleepy Sickness and Milk Fever in Ewes, 115.
Gillard, S. O.—Sweet Corn Culture, 321.
Gladioli, 183.
Glanville, E. B.—Developing Scrub Land, 417.
Glasshouses, Management of, 109.
Grader, Fruit, Attachment to Improve Feed of Screw-type, 500.
Grafting and Budding Equipment, Portable Stand for, 126.
Grape Growing in the Home Garden, 401, 521.
Grass Growth, Measuring, 33.
Grassland, Ploughable Tussock, in Southland, Developing, 46.
Greens, Autumn and Winter, in Home Garden, 439.
Griffin, L. A.—Location of Apiaries in Relation to Honey Crop Returns, 225.

H

- Hagedoorn System of Poultry Breeding, 107.
- Harrier Hawks, Investigation of, 18.
- Harvesting Machinery, Preventing Fires in, 495.
- Hawthorn Fences, Mechanical Cutting of, 399.
- Hay, Baled, Improved Sledge for Stooking, 227.
- Hedges, Hawthorn, Mechanical Cutting of, 399.
- Holmes, G. A.—Growing Peas for Canning in North Taieri, 335.
- Home, Colour in the, 93.
- Home Garden Diary, 533.
- Home Garden Fertilisers, 161.
- Home Garden Grape Growing, 401, 521.
- Home Garden Notes, 65, 161, 195, 295, 433, 529.
- Home Garden Planning, 529.
- Home Garden, Plant Diseases in, 195.
- Home Garden Seed Sowing, 531.
- Home Garden Soil Improvement, 531.
- Home Orchard in Summer, 497.
- Home Orchard, Spring Work in, 219.
- Home Orchards, Winter Work in, 39.
- Home Science School, 540.
- Home Vegetable Gardens, More Produce from, 3.
- Honey Flow, Domestic Bee Colony Requirements during, 509.
- Honey-house Bogey, 61, 396.
- Honey House, Construction of, 491.
- Hood, Towelling, for Baby, 192.
- Hopkirk, Dr. C. S. M., Appointed to FAO Position, 118.
- Hormones, Plant Injury Caused by, 319.
- Horokiwi-Pauatahanui-Judgeford Land Survey, 144.
- Horticultural Crops, Irrigation of, 23.
- Household Poultry Diseases, 487.
- Household Poultry Notes, 17, 127, 223, 347, 383, 487.
- Household Poultry, Recognition of Good and Poor Layers in, 383.
- Hume, J. E.—Shelter in Citrus Orchards, 135.

I

- Inch, R.—
  - Control of Nodding Thistle, 233.
  - Improved Sledge for Stooking Baled Hay, 227.
- Ironing, Pleasanter, 187.
- Irrigated Land, Production from, 525.
- Irrigation in Home Gardens, 437.
- Irrigation of Horticultural Crops, 23.

J

- Jacket, All-purpose Knitted, in Simple Pattern, 447.
- Jacket, Knitted, for Young Man, 272.
- Jacket, Matinee, and Dress, Baby's, 191.
- Jacks, H.—Health Aspects of Plant Therapeutants, 70.
- Jersey Dairy Cow Replacements, Selection of, 133.
- Jersey, Knitted, for Small Boy, 351.
- Jones, J. H.—Hagedoorn System of Poultry Breeding, 107.
- Jourdain, W. L.—Range Shelters for Poultry, 37.
- Judgeford-Pauatahanui-Horokiwi Land Survey, 144.
- Jugs, Electric, Safety with, 557.
- Jumper, Knitted, in Contrasting Colours, 177.
- June, R. I.—
  - Attachment to Improve Feed of Screw-type Fruit Grader, 500.
  - Common Faults in Packing of Apples, 526.
  - Portable Stand for Grafting and Budding Equipment, 126

K

- Kales for Winter Feeding, 35.
- Keds, Lice, and Mites in Sheep, 209.
- Kelly, G. G.—
  - Firearm Accidents, 16, 134, 216, 333,
  - Using Firearms Safely and Skilfully, 19.
- Kennelly, A. G.—Shallots, 125.
- Kitchen, Ideal, Equipment and Planning for an, 555
- Kitchen Sink and Bench, Choosing a, 367.
- Knitted Jacket, All-purpose, in a Simple Pattern, 447.
- Knitted Jacket for Young Man, 272.
- Knitted Jersey for Small Boy, 351.
- Knitted Jumper in Contrasting Colours, 177.

L

- Lamb, Linton Farm's Small, 382.
- Land Planning, Farming Potential as Guide to, 144.
- Land Resources, World, 508.
- Lawns, Spring Treatment of, 337.
- Left-over Food, Attractive Meals from, 453.
- Lice, Keds, and Mites in Sheep, 209.
- Lime, Field Loader for Bulk, 105.
- Lime, Stockpiling and Bulk Handling of, 4.
- Linen Flax, Rust of, 123.
- Linseed, Rust of, 123.
- Livestock, Care of, during August, 34; during September, 142; during October, 236; during November, 316; during December, 416; during January, 504.
- Livestock, Influence of Hygiene on Health of, 151.
- Loader, Field, for Bulk Lime, 105.
- Lockhart, J. M.—Protecting Water Troughs, 328.
- Lockie, M. J.—Scented Shrubs, 173.
- Longwill, A.—
  - Increased Prices Incentive to More Pig-meat Production, 119.
  - Pig Competitions Show Value of Rapid Growth-rate, 377.
- Low-volume Sprayer, Effect of Blockage of, 536.
- Lucerne Seed, Inoculation of, 7.
- Lynch, P. B., and Miller, J. G.—Wheat Trials, 129.
- Lynch, P. B.—
  - Measuring Grass growth, 33.
  - New Wheat Varieties, 129.

M

- McCann, P. J.—Tuberculosis of Farm Animals, 8.
- Machinery, Harvesting, Preventing Fires in, 495.
- Mackintosh, G. R.—Selection of Dairy Herd Replacements, 133.
- McMeekan, C. P., and Smith, D. M.—Feeding and Management of Sow and Litter, 309.
- McPherson, G. K.—Production from Irrigated Land, 525.
- Macpherson, Molly—
  - Sponge Cakes, 178.
  - Towelling Hood for Baby, 192.
- Macpherson, Nell—
  - Aspic Makes Appetising Dishes, 86.
  - Christmas Cards, 359.
  - Colour and Texture in Planning Attractive Meals, 446.
  - Croquettes, Cromesquis, and Rissoles, 262.
  - Garnishes for Soups, 192.
  - Salad Dressings, 548.
  - Selection and Care of China, 353.
  - Summer Play Clothes for Girls or Boys, 444.
  - Supper Snacks, 352.
- Madden, E. A.—
  - Flight Strips for Topdressing Aeroplanes, 64.
  - Spring Treatment of Lawns, 337.
- Malting Barley Variety Trials in Ellesmere County, 479.
- Matthews, L. J.—Control of Rushes, 240.
- Mayo, K. L.—Drain Maintenance, 143.
- Meals, Attractive, Colour and Texture in Planning, 446.
- Meals, Attractive, from Left-overs, 453.
- Mechanical Cutting of Hawthorn Fences, 399.
- Mechanical Inter-row Cultivation of Crops, 314.
- Meteorological Records for May, 6; for June, 150; for July, 212; for August, 336; for September, 442; for October, 536.
- Milk Fever in Ewes, 115.
- Milking, Elevated-bail, System of, 101.
- Milking Machines, Air-flow Meter for Testing, 213.
- Milk Powder Production, Substantial Rise in, 400.
- Miller, J. A. S.—Seed Potatoes, 237.
- Miller, J. G., and Lynch, P. B.—Wheat Trials, 129.
- Minister of Agriculture, Statements by, 3, 99, 370.
- Mitchell, J. G.—Cutting and Burning Scrub, 417.
- Mites, Lice, and Keds in Sheep, 209.
- Mole-drain Plough, Modified, 20.
- Montgomery, R. G.—Importance of Farm Woolshed Workmanship, 274.
- Moore, Evelyn E.—Colour in the Home, 93.
- Moore, O. G.—
  - Inoculation of Lucerne Seed, 7.
  - Rape Crop, 143.
- Mower, Safe Handling of, 62.
- Mulching of Home Garden Soils, 435.
- Murray, J. R.—
  - Effect of Blockage of Low-volume Sprayer, 536.
  - Push-off Sweep for Silage Making, 415.

N

- Napier, C. L.—Home Garden Notes, 65, 161, 195, 295, 433, 529.
- Nightdress, Honeycomb, 357.
- Nitrogenous Fertiliser Trials, 233.
- Nodding Thistle, Control of, 233.
- North Otago, Fruit and Vegetable Cropping in, 55.
- North Taieri, Growing Peas for Canning in, 335.

O

- Orchard, Home, in Summer, 497.
- Orchard, Home, Spring Work in, 219.
- Orchards, Citrus, Shelter in, 135.
- Orchards, Home, Winter Work in, 39.
- Otago, North, Fruit and Vegetable Cropping in, 55.
- Otago, Ryecorn in, 283.
- Owtram, I. H., and Burrell, J. P.—Planting Shelter for Pigs, 475.
- Owtram, I. H.—
  - Importance of Creep, 63.
  - Pumping Skimmed Milk to Piggeries, 217.
  - Ringing of Pig Breeding Stock, 290.

P

- Packing of Apples, Common Faults in, 526.
- Pack-up Snacks, 81.
- Paine, Helen—
  - Drawn-thread Embroidery, 82.
  - Honeycomb Nightdress, 357.
  - Sewing Machine Attachments, 257.
- Pampas Grass, Decline in Use of, 114.
- Parcels, Proper Wrapping of, 461.
- Paspalum in Bay of Plenty, 57.
- Pasture and Lucerne Hay, 317.
- Pasture Management, 417, 505.
- Pasture Production, Phosphates and, 443.
- Pastures and Crops, Spring-sown, 143.
- Paterson, C. R.—
  - Honey House Construction, 491.
  - Queen Excluders and Their Use in Apiary Management, 397.
- Paton, W. N.—Types of Farming Practised in New Zealand, 159, 234, 288, 386, 484.
- Pauatahanui-Judgeford-Horokiwi Land Survey, 144.
- Peach Fruits, Thinning of, 389.
- Pea Crop, 317.
- Peas, Growing, for Canning in North Taieri, 335.
- Peas, Growing, for Canning in Pukekohe, 229.
- Peat Development, 315.
- Pedigree Sow Records, 128.
- Peppermint Oil Production Trials, 240.
- Pests of Pot Plants, 89.
- Pests, Vegetable, 295.
- Phillips, D. S. M.—Air-flow Meter for Testing Milking Machines, 213.
- Phosphates and Pasture Production, 443.
- Pig Breeding Stock, Ringing of, 290.
- Pig Competitions Show Value of Rapid Growth-rate, 377.
- Piggeries, Pumping Skimmed Milk to, 217.
- Pig Litter and Sow, Feeding and Management of, 309.
- Pig-meat Production, Increased Prices Incentive to More, 119.
- Pig Production, Importance of Creep in, 63.
- Pigs, Planting Shelter for, 475.
- Pigs, Sugar Beet as Winter Supplement for, 202.
- Plant Diseases in Home Garden, 195.
- Planting and Sowing Guide for Home Gardens, 66.
- Plant Injury Caused by Hormones, 319.
- Plant Quarantine Regulations, 304.
- Plants, Propagating, by Half-ripe Cuttings, 549.
- Plant Therapeutants, Health Aspects of, 70.
- Play Balls are Fun for Toddlers, 457.
- Play Clothes, Summer, for Girls or Boys, 444.
- Pools, Garden, 449.
- Population Movement from Country to Towns, 510.
- Pot Plants, 87.
- Potting Soil, 87.
- Poultry, Basis of Disease Prevention in, 169, 203, 393.
- Poultry Breeding, Hagedoorn System of, 107.
- Poultry Diseases, Control of, 393.
- Poultry, Household, Recognition of Good and Poor Layers in, 383.
- Poultry, Range Shelters for, 37.
- Pratt, E. A.—Keds, Lice, and Mites in Sheep, 209.
- Pudding, Christmas, 356.
- Pukekohe, Growing Peas for Canning in, 229.
- Pullets, Laying, Need of Vitamin A in Diet for, 293.
- Pullets, Perching, Management of, in Household Flocks, 127.
- Pullover, Long-sleeved Sports, for Summer, 543.
- Push-off Sweep for Silage Making, 415.

Q

Quarantine Regulations, Plant, 304.
Queen Bee Excluders, 397.

R

Range Shelters for Poultry, 37.
Rayon Fabrics, 544
Renouf, L. R.—Irrigation of Horticultural Crops, 23.
Research Work by Extension Division:
  Measuring Grass Growth, 33.
  Nitrogenous Fertilisers, 233.
  Peat Development, 315.
  Phosphates and Pasture Production, 443.
  Production from Irrigated Land, 525.
  Wheat, 129.
Ringing of Pig Breeding Stock, 290.
Rissoles, 262
Roberts, D.—Responsibilities of Beekeepers, 131.
Ross, W. D.—Keeping Foot and Mouth Disease out of New Zealand, 339.
Row Crop Cultivation, 505.
Rushes, Control of, 240.
Russian Slice Cake, 96.
Ryecorn in Otago, 283.
Ryegrass Seed, Protecting, from Weather, 524.

S

Salad Dressings, 548.
Salad Preparation, Pointers for, 452.
Sand Country in Australia, Developing, 346.
Sausage Apples, Stuffed 358
Saxby, S. H., and Faithful, W.—Developing Ploughable Tussock Grassland in Southland, 46.
Saxby, S. H.—
  Decline in Use of Pampas Grass, 114.
  Pasture Management, 505.
  Spring-sown Pastures, 143.
Scarf, Woollen, 182.
Scott, D. F.—
  Care of Belt Drives, 208.
  Installation and Maintenance of Electric Fencing 409.
  Safe Handling of Mower, 62.
Scott, L. C.—Stockpiling and Bulk Handling of Lime, 4.
Scott, R. H., and du Faur, R. T.—
  Farming Potential as Guide to Land Planning, 144.
  Fat-stock Production Survey of Wairoa County, 241.
Scrapie Disease, 305.
Scrub, Cutting and Burning, 417.
Scrub Land, Developing, 417.
Seasonal Notes by Extension Division, 35, 143, 237, 317, 417, 505.
Seed, Lucerne, Inoculation of, 7.
Seed, Ryegrass, Protecting from Weather, 524.
Seed Sowing and Planting, Home Garden, 531.
Sewing Machine Attachments, 257.
Shallots, 125.
Shand, G. D.—Excessive Wool Branding, 106.
Sheep Farming in New Zealand, Intensity of, 386
Sheep, Keds, Lice, and Mites in, 209.
Shelter for Pigs, Planting, 475.
Shillitto, N. L.—Pea Crop, 317.
Shrubs, Propagating, by Half-ripe Cuttings, 549.
Shrubs, Scented, 173
Silage and Crops, Production of, 237.
Silage Making, Push-off Sweep for, 415.
Sink and Bench, Kitchen, Choosing a, 367.
Skimmed Milk, Pumping, to Piggeries, 217.
Skips in Woolsheds, 281
Sleepy Sickness in Ewes, 115.
Smellie, E.—Importance of Good Bee Combs, 329.
Smith, D. M., and McMeekan, C. P.—Feeding and Management of Sow and Litter, 309.
Smith, E. G.—Lucerne in Canterbury, 317.
Snacks, Pack-up, 81.
Snacks, Supper, 352.
Soil-testing Services to be Expanded, 486.
Soups, Garnishes for, 192
South Auckland, Basic Slag Responses in, 327.
Southland, Developing Ploughable Tussock Grassland in, 46.
Sow and Litter, Feeding and Management of, 309.
Sowing and Planting Guide for Home Gardens, 66.
Sponge Cakes, 178.
Sports Pullover, Long-sleeved, for Summer, 543.
Sprayer, Low-volume, Effect of Blockage of, 536.
Sprays for Diseases in Home Garden, 199.
Sprays for Vegetable Pests, 301.
Stephens, P. R.—The Department of Agriculture, 371.
Sterilising Flower Garden Soil, 361.
Stewing, 460.
Stock Amendment Act 1952, 496.
Stockdill, S. M. J.—Ryecorn in Otago, 283.
Story, L. F.—Bluestone Absorbed by Wool Affects Processing, 501.
Strain, Maud B.—
  Pleasanter Ironing, 187.
  Rayon Fabrics, 544.
  Tea Dishes Can be Prepared in Advance, 537.
  Two-way Toasting Fork, 554.
Stuffed Sausage Apples, 358
Sugar Beet as Winter Supplement for Pigs, 202.
Summer Play Clothes for Girls or Boys, 444.
Supper Snacks, 352.
Swarming of Domestic Bees, Controlling the, 307.
Swede and Turnip Seed, Government-approved, 212.
Sweet Corn Culture, 321.

T

Taieri, North, Growing Peas for Canning in, 335.
Tandem Bail, 101.
Tea Dishes Can be Prepared in Advance, 537.
Therapeutants, Plant, Health Aspects of, 70.
Thinning of Peach Fruits, 389.
Thomas, H. P.—Spring Work in Home Orchard, 219.
Thompson, F. B.—Peat Development, 315.
Thompson, J. J.—Basis of Disease Prevention on Poultry Farms, 169, 203 393.
Toasting Fork, Two-way, 554.
Todd, K.—Farming in New Zealand: Ashley County 418
Toddlers, Play Balls for, 457.
Towelling Hood for Baby, 192.
Tractor Accidents in 1951, 466.
Transplanting in Home Garden, 67.
Trees, Propagating, by Half-ripe Cuttings, 549.
Troughs, Water, Protecting 328.
Tuberculosis of Farm Animals, 8.
Turnip and Swede Seed, Government-approved, 212.
Tussock Grassland in Southland, Developing Ploughable, 46.

U

United Kingdom's Food Supplies, 22.
Unwin, Eirene E.—
  Attractive Meals Can be Made from Leftovers 453.
  Equipment and Planning for an Ideal Kitchen, 555.
  Play Balls are Fun for Toddlers, 457.
  Pointers for Salad Preparation, 452.
  Proper Wrapping of Parcels, 461.

V

Vegetable and Fruit Cropping in North Otago, 55.
Vegetable Pests, 295.
Vegetables, Preserving Nutrient Value of, 263.
Viggers, D. A.—Population Movement from Country to Towns, 510.

W

Wairoa County, Fat-stock Production Survey of, 241
Walker, D.—Wheat Production, 525.
Wallace, G. V.—Influence of Hygiene on Health of Livestock, 151.
Wallace, J. O.—Kales for Winter Feeding, 35.
Water Troughs, Protecting, 328.
Weed Control in Home Gardens, 433.
Wheat Production 525
White, R. R.—Management of Glasshouses, 109.
Williams, T. P. J.—Domestic Beekeeping Notes, 239, 307, 441, 509.
Winter Greens in Home Garden, 439.
Wool, Bluestone Absorbed by, Affects Processing, 501
Wool Branding, Excessive, 106.
Wool, Brands in, 303.
Woollen Scarf, 182
Woolshed Workmanship, 274.
World Land Resources, 508.
Wraight, J. D.—
  Linseed, 237.
  Mechanical Cutting of Hawthorn Fences, 399.
Wrapping of Parcels, 461.

Y

Young Farmers' Club Movement, 43.

Now available from main offices of the Department of Agriculture . . .

"PRIMARY PRODUCTION IN NEW ZEALAND"

1952 Edition

2s. 6d. per copy, post free

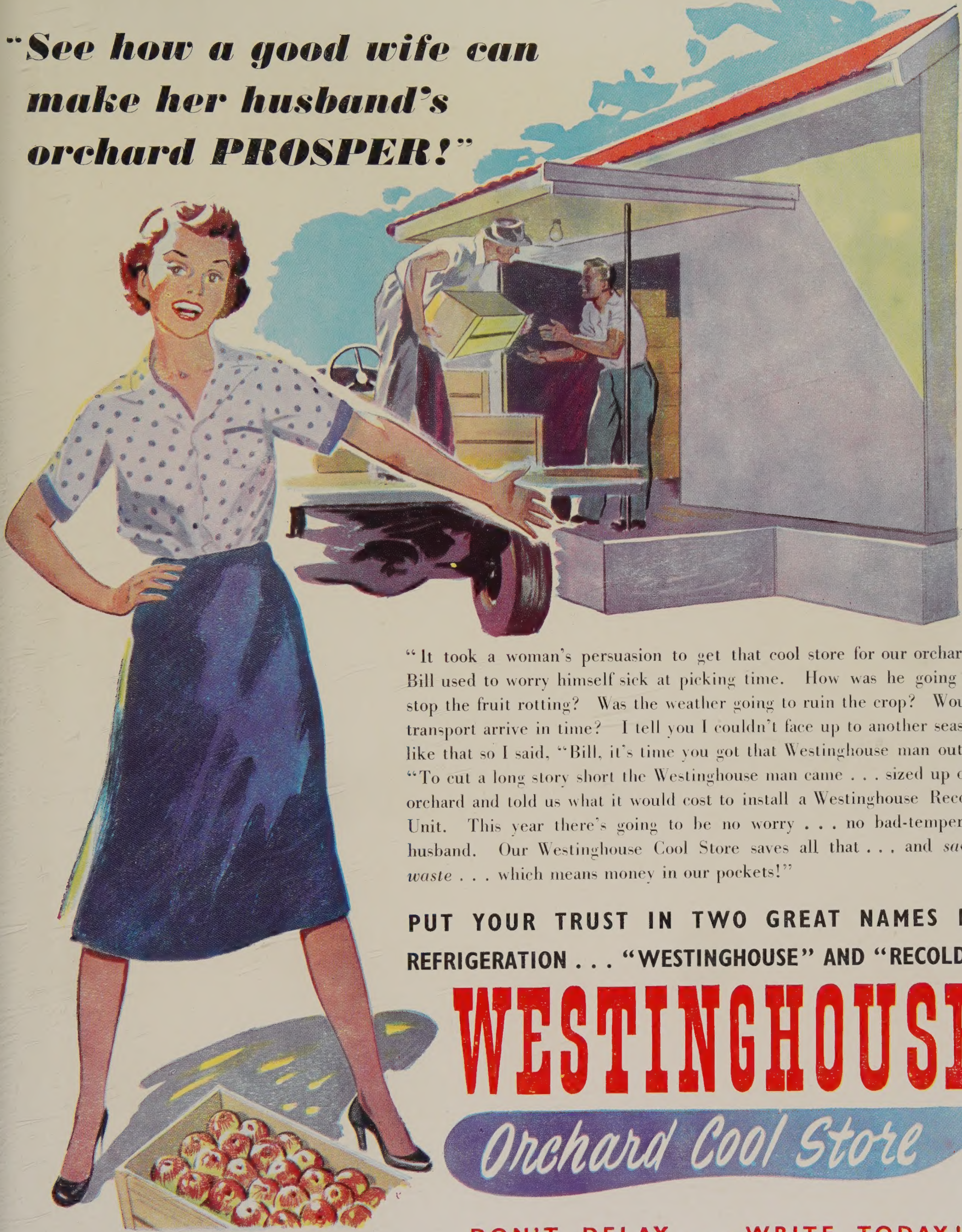
★

Latest edition in this popular series. The text has been further expanded and the latest volume contains 160 pages.

An invaluable reference book for students, teachers, lecturers, farming organisations, or others who require basic information on production and marketing of primary produce.

Printed by Blundell Bros. Ltd. (The Evening Post), Wellington—83926

"See how a good wife can make her husband's orchard PROSPER!"



"It took a woman's persuasion to get that cool store for our orchard! Bill used to worry himself sick at picking time. How was he going to stop the fruit rotting? Was the weather going to ruin the crop? Would transport arrive in time? I tell you I couldn't face up to another season like that so I said, "Bill, it's time you got that Westinghouse man out!" "To cut a long story short the Westinghouse man came . . . sized up our orchard and told us what it would cost to install a Westinghouse Recold Unit. This year there's going to be no worry . . . no bad-tempered husband. Our Westinghouse Cool Store saves all that . . . and *saves waste* . . . which means money in our pockets!"

PUT YOUR TRUST IN TWO GREAT NAMES IN REFRIGERATION . . . "WESTINGHOUSE" AND "RECOLD"

WESTINGHOUSE

Orchard Cool Store

DON'T DELAY . . . WRITE TODAY!

FREE! Westinghouse engineers will visit your orchard and quote you for a store for the 1952-53 season. Existing wood or concrete sheds can be converted or new stores built. For full particulars write to the nearest branch of H. W. Clarke (N.Z.) Ltd. (See addresses at left.)

H. W. CLARKE (N.Z.) LTD., 42-46 Cable St., Wellington.
105 Anzac Avenue, Auckland. 256 Cashel St., Christchurch.
1 Cliff St., Timaru. 84 Tainui St., Greymouth. 28a Bridge St.,
Nelson. 78 Fitzherbert Avenue, Palmerston North. Victoria
Avenue, Hamilton. H. E. THOMAS LTD., 399 Moray Place,
Dunedin. 85-87 Spey St., Invercargill.

AN INTERNATIONAL SOURCE OF SUPPLY

U.S.A., Gt. Britain, Australia, France, Sweden, Canada, Germany, New Zealand — from IH Factories throughout the world comes machinery to make your work on the land easier, more efficient and more rewarding.

Available to you from

INTERNATIONAL HARVESTER COMPANY OF N.Z. LTD.

and its Dealer Organisation